Optimal Dynamics Analysis
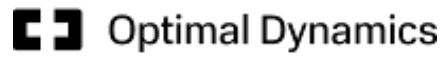
Optimal Dynamics

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0) Introduction to Optimal Dynamics

: Optimal Dynamics, a company specializing in AI-driven logistics software for businesses, seeks to unlock growth.

Scale & Optimize Growth

Go-To-Market

FIT!

C] Optimal Dynamics

Product Market

FIT!

[Happy Customers]

standard logistics

SCHNEIDER NATIONAL

NS NORFOLK SOUTHERN
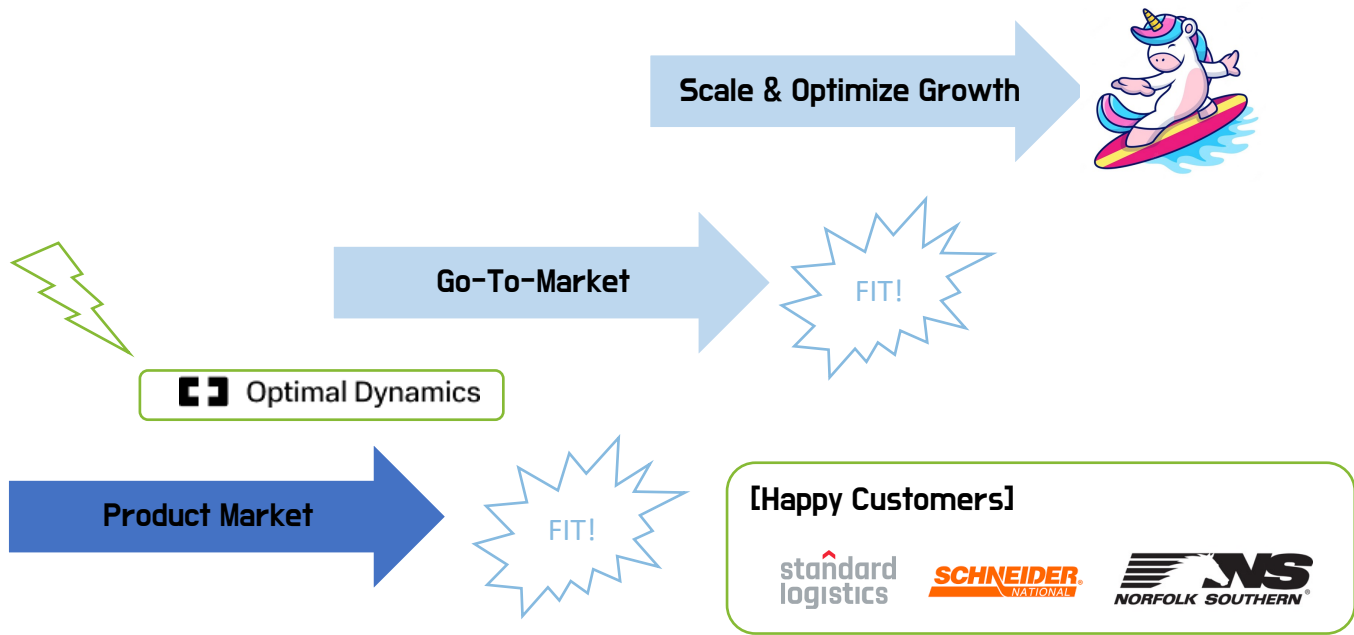
Optimal Dynamics is stuck at the product-market fit stage and is struggling to unlock growth. This promising startup relies on founder-led growth, with one of its co-founders, a Professor Emeritus at Princeton University.

Optimal Dynamics needs to generate leads and build a go-to-market playbook to transition from founder-led growth to unlocked growth.

FOUNDER GROWTH (PADDLE) → **UNLOCK GROWTH** (CATCH THE WAVE) → **SCALE GROWTH** (SURF THE WAVE)

40 years of research

PRINCETON UNIVERSITY

ORFE
Operations Research & Financial Engineering

C] Optimal Dynamics

1. Founding Idea of Optimal Dynamics
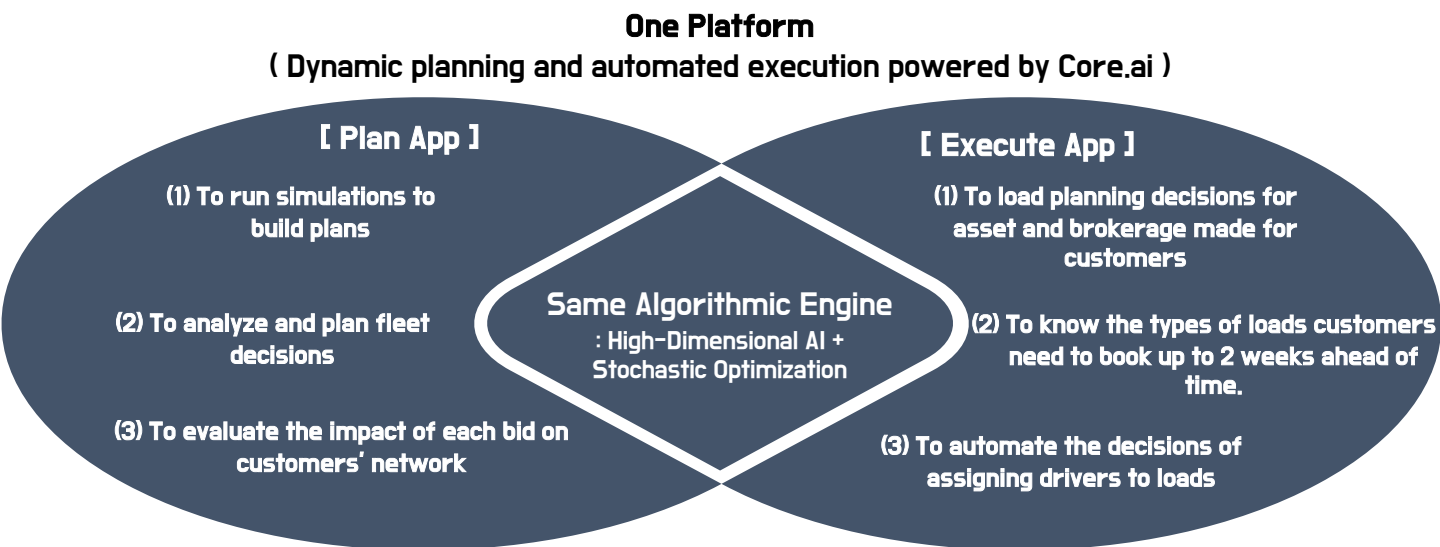
Disruption Wave:

Digital transformation (DX) in logistics.

Problem:

Trucking companies need logistics technology to support decision-making and adapt to changing situations even when they have very little training data, a common issue in the logistics industry.

Product:

Robust AI SaaS Platform, called One Platform, to help manage and plan for uncertainty in the logistics and supply chain industry.

One Platform
(Dynamic planning and automated execution powered by Core.ai)

[Plan App]

(1) To run simulations to build plans

(2) To analyze and plan fleet decisions

(3) To evaluate the impact of each bid on customers' network

Same Algorithmic Engine
: High-Dimensional AI + Stochastic Optimization

[Execute App]

(1) To load planning decisions for asset and brokerage made for customers

(2) To know the types of loads customers need to book up to 2 weeks ahead of time.

(3) To automate the decisions of assigning drivers to loads

This AI system can take in a wide range of details and plan for how the real world operates, allowing companies to have a system that works in the real world.

2. Homework for the Founding Idea

Did Optimal Dynamics talk not only to customers but also to industry experts? YES.

–Optimal Dynamics helped one early customer, which owned 120 power units, benefit from better utilization of equipment and more efficient operations.

–The Castle Lab of Princeton University, the predecessor of Optimal Dynamics, has had a partnership with industry partners for a long time.

3. Founding Idea test: Does it have "gravity"?

Validation

An early customer with 120 power units saved $4 million using the Optimal Dynamics platform. This was achieved through improved equipment utilization, more efficient operations, and the selling unnecessary vehicles. Additionally, the company reduced its trucking logistics team from 10 to just one, now focusing on managing exceptions to normal business operations.

The mission is born: The mission is to be the decision layer of logistics in order to help companies automate and optimize their operations.

4. The Co-founders
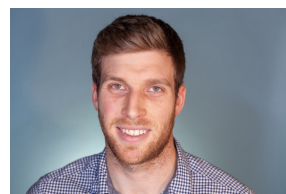
Co-founder fit:

Co-founders are a father and son duo who share a passion, have a solid working relationship, and share values

Co-founder skills:

Warren Powell, Professor Emeritus at Princeton University, is responsible for product and technical aspects.
Daniel Powell, the CEO, is responsible for sales and marketing.

Warren Powell (Father)

Daniel Powell (Son)

5. Early Investors

Bessemer Venture Partners

THE WESTLY GROUP

FITZ GATE VENTURES

"We invest in transformative companies and technologies, and we put Optimal Dynamics in that category. Daniel and the team have really just scratched the surface of how we believe Optimal Dynamics will transform the transportation and logistics industry."– Tim Wang, Managing Partner at The Westly Group

"Bessemer is excited to partner with Optimal Dynamics to help drive their continued expansion. Logistics operators need to consider a staggering number of variables, making this an ideal application for a SaaS product that can help operators make more informed decisions by leveraging Optimal Dynamics industry leading technology. We were really impressed with the combination of their deep technology and the commercial impact that Optimal Dynamics is already delivering to their customers. We look forward to helping them continue to build the future layer of supply chain intelligence."
– Mike Droesch, Partner at Bessemer Venture Partners.

2) Product-Market Fit

: AI-powered SaaS Platform for Logistics

1. Paying reference customers, Real usage, and Recommendation

Volker Bargenda
[President at Standard Logistics]

Paying Customers:

Over the past year(2021), Standard Logistics doubled its fleet and added new locations, drivers, and equipment, which increased complexity and workload. To manage this growth effectively, Standard Logistics sought the right technology partner. After evaluating various options, the company ultimately chose Optimal Dynamics to facilitate efficient and strategic development rather than mere expansion for the sake of it.

Real Usage and Recommendation:

Using Google Sheets for managing the growing logistics network of Standard Logistics proved to be inefficient. Before the introduction of Optimal Dynamics, it was challenging to analyze the overall impact of opening new locations and understanding their effect on the existing network.

Optimal Dynamics provided the ability to run "what-if" scenarios, helping Standard Logistics make informed decisions about adding drivers, opening new locations, and other growth strategies. This tool, when combined with the team's logistics expertise and knowledge, offered greater confidence in the strategic decisions of Standard Logistics.

2. Finding PMF

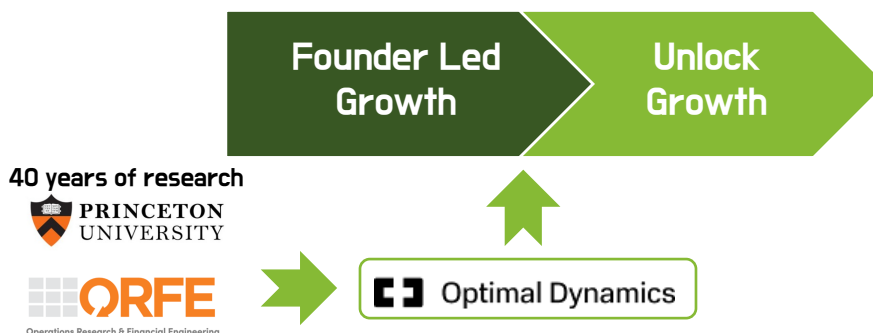**Finding PMF: AI-powered SaaS Platform for Logistics**

"The company ultimately zoomed in on the trucking industry, which involves the kind of sequential decision-making that Professor Emeritus Powell of Princeton University, the father of the founders, had focused on throughout his career. The truckload sector is rife with uncertain variables. We are the first company that can learn and plan for such an uncertain future. There's been a surge in investment in logistics and trucking from VCs in recent years as more and more investors recognize the potential to disrupt this massive and fragmented market completely. However, rather than building an entirely new trucking marketplace or approaching it as a vertically integrated solution, Optimal Dynamics chose the simpler enterprise SaaS route to offer better optimization to existing companies."

- Daniel Powell, CEO at Optimal Dynamics

3) Go-To-Market Fit

:'Catch the wave!' - Let's focus on 'Urgent Pain'

1. Optimal Dynamics wants to unlock growth

Founder Led Growth → **Unlock Growth**

40 years of research
PRINCETON UNIVERSITY
ORFE
Operations Research & Financial Engineering
→ Optimal Dynamics

Optimal Dynamics is in the 'paddling' phase. In other words, the company frequently relies on founder-led growth. Even though they have five seasoned salespeople, the passionate and empathetic founder leads to drive success by closing deals and connecting with customers.
To unlock further growth, Optimal Dynamics should generate substantial leads to build momentum and establish a Go-To-Market (GTM) playbook for repeatability.

2. Catch the Wave

To get straight to the point, Optimal Dynamics needs more marketers and salespeople. This area needs to be addressed. However, they've successfully identified the 'Urgent Pain'.

Generate Lots of Leads for momentum:

Hire superheros:

- Marketer (Inbound, Thought Leadership, Demand generation)
- Sales (Outbound/prospect), SDR's
- Business Development (Partnership)

Give them an amazing weapon:

The weapon the heroes are using focuses on 'Urgent Pain'.

– Why buy now? Not 6 months later?

Because of 'Urgent Pain'.
What do logistics customers really want? :'Business Certainty'

There will be a detailed explanation about this urgent pain in next two pages.

3-1) Urgent Pain

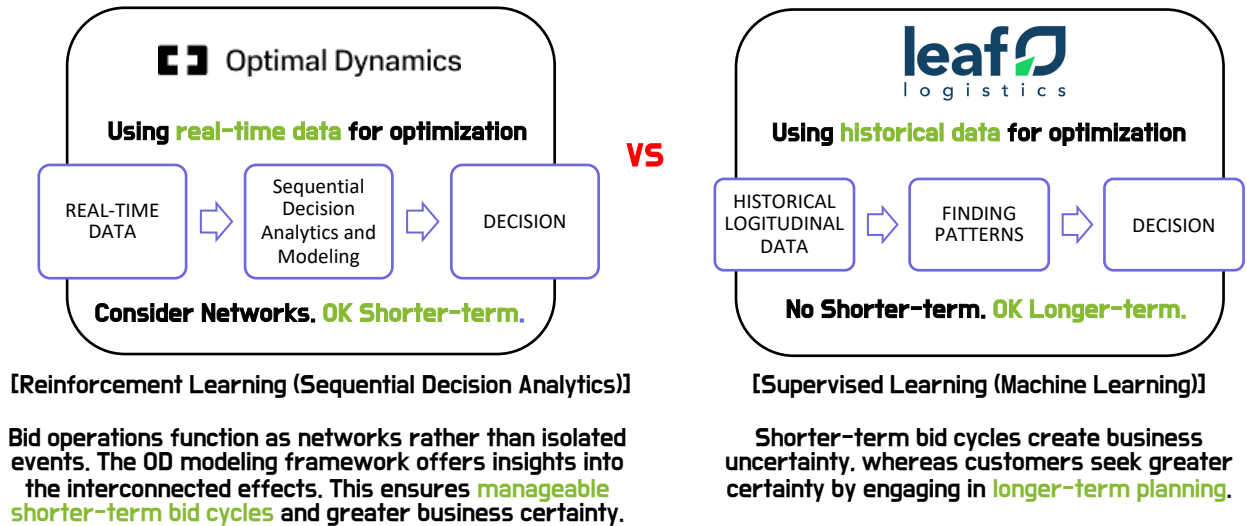## : Why buy now? The urgent pain for logistics customers is 'business certainty'

Two logistics solution providers using different approaches for customers

C] Optimal Dynamics

leaf l o g i s t i c s

	standard logistics	**SOLVAY** asking more from chemistry®
Whom — Customer Development: which company experienced difficulties in operating its business?		
Why — Problem: what was the customer's problem?	From 2021 to 2022, Standard Logis-tics doubled its fleet, expanded in-to new locations, hired more driv-ers, etc. This increased the company's workload and complexity. Thus, the company struggled to manage this growth effectively.	Solvay, which needs to provide services to customers based on reliability, is suffering from business uncertainty in the freight market.
Why so? — What was the root cause of the customer's problem?	The use of Google Sheets to manage their expanding logistics network had limitations. It was inefficient, prone to errors, and failed to handle the increased complexity of growth.	Sudden and large changes in the cost of shipping can make it hard for businesses to plan ahead and create uncertainty.
So What — Suggested Solution	**One Platform of Optimal Dynamics** (Dynamic planning and automated execution powered by Core.ai)	**Leaf Platform** to use historical data with machine learning technology in order to find pattern.
Why — Why did the customer choose only this solution?	1) Strategic planning tool to reduce decision-making time from weeks to minutes, providing a faster and more efficient process. 2) The day-to-day operational tool to provide dispatchers with insights on which loads are favorable and which loads should be passed to brokerage or external carriers.	Customers believe that machine learning can solve all the logistics issues.
How to — How did the solution help the customer?	Core.ai offered sequential decision analytics and modeling to address challenges where every choice in a series limits future options, assistin-g the client in adding drivers, launc-hing new locations, and implemeti-ng other growth strategies.	Using machine learning to identify patterns in historical Data.
If — What were the expected results of the solution proposed for the customer's issue?	**Real-time Optimization** for planners and drivers	**Finding the pattern** to solve the issue for shippers and carriers

3-1) Urgent Pain

: Optimal Dynamics offers the better solution for 'business certainty'

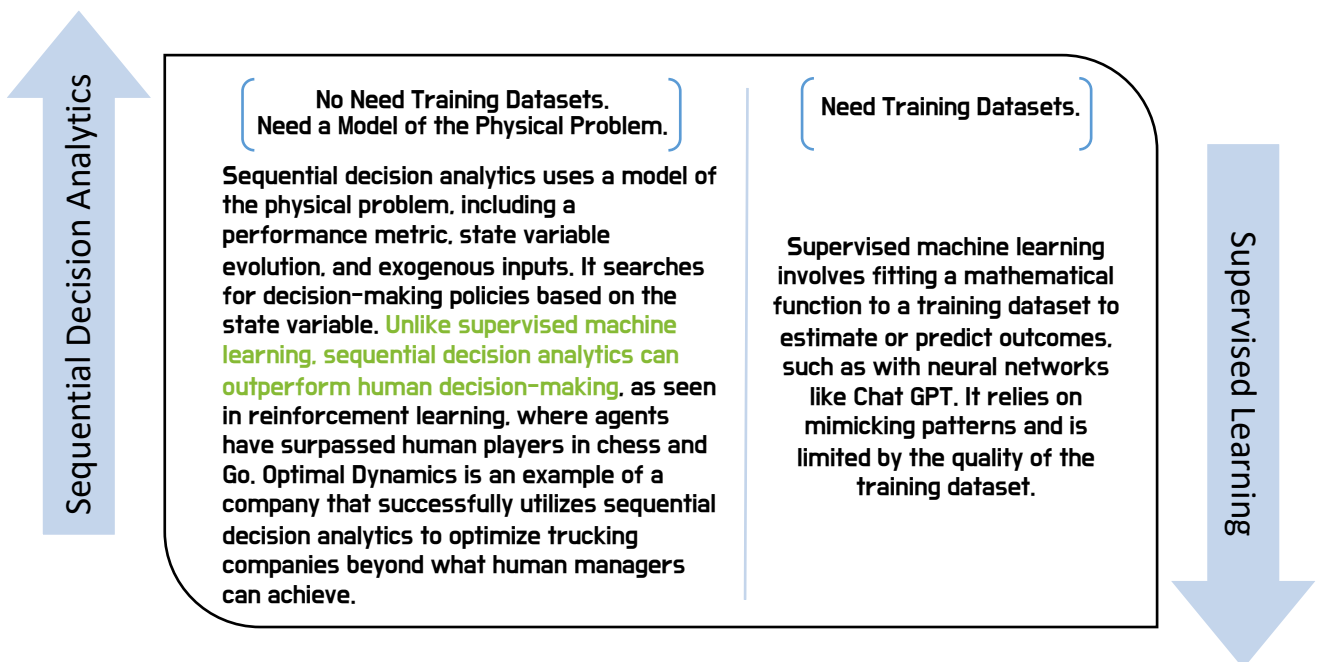## Diverse Approaches to a Universal Customer Challenge in Logistics

Same Problem: What is the best way to manage the bidding process to give customers greater business certainty?

Optimal Dynamics

Using real-time data for optimization

| REAL-TIME DATA | → | Sequential Decision Analytics and Modeling | → | DECISION |

Consider Networks. OK Shorter-term.

VS

leaf logistics

Using historical data for optimization

| HISTORICAL LOGITUDINAL DATA | → | FINDING PATTERNS | → | DECISION |

No Shorter-term. OK Longer-term.

【Reinforcement Learning (Sequential Decision Analytics)】

Bid operations function as networks rather than isolated events. The OD modeling framework offers insights into the interconnected effects. This ensures manageable shorter-term bid cycles and greater business certainty.

【Supervised Learning (Machine Learning)】

Shorter-term bid cycles create business uncertainty, whereas customers seek greater certainty by engaging in longer-term planning.

Sequential Decision Analytics is a fundamental solution for business certainty.
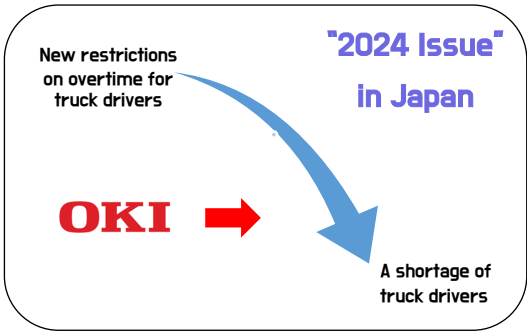
Optimal Dynamics uses sequential decision analytics to provide logistics customers with business certainty.

By employing reinforcement learning, a form of sequential decision analytics, Optimal Dynamics surpasses human decision-making abilities in logistics issues and outperforms supervised machine learning.

Sequential Decision Analytics ↑

**No Need Training Datasets.
Need a Model of the Physical Problem.**

Sequential decision analytics uses a model of the physical problem, including a performance metric, state variable evolution, and exogenous inputs. It searches for decision-making policies based on the state variable. Unlike supervised machine learning, sequential decision analytics can outperform human decision-making, as seen in reinforcement learning, where agents have surpassed human players in chess and Go. Optimal Dynamics is an example of a company that successfully utilizes sequential decision analytics to optimize trucking companies beyond what human managers can achieve.

Need Training Datasets.

Supervised machine learning involves fitting a mathematical function to a training dataset to estimate or predict outcomes, such as with neural networks like Chat GPT. It relies on mimicking patterns and is limited by the quality of the training dataset.

Supervised Learning ↓

3-2) Suggestion for Optimal Dynamics

: Japanese logistics industry will go through an urgent pain

New restrictions on overtime for truck drivers

OKI ➡

"2024 Issue" in Japan

A shortage of truck drivers

The transportation industry in Japan is concerned about the potential impact of work-style reform laws, which include new limits on overtime, on the physical distribution sector. This could result in a series of problems known as the "2024 issue."

【Benchmarking for Optimal Dynamics】

To solve this issue, OKI Electric Industry released 'Cost-minimizing delivery route optimization AI' to find the optimal delivery method in just 10 minutes.

This is the way that Optimal Dynamics should follow.

Collaboration ➤ **Japanese Market** ➤ **New Customers**

Optimal Dynamics
➕
U.S. subsidiary of Japanese freight companies

Optimal Dynamics

YAMATO TRANSPORT · SAGAWA · DHL
NEX NIPPON EXPRESS · JAPAN POST
DB SCHENKER 西濃シェンカー株式会社 · FedEx · UPS

Due to the characteristics of the Japanese market, Optimal Dynamics will establish a collaboration with U.S. subsidiary of Japanese freight companies beforehand. This would enable Optimal Dynamics to test and enter the Japanese market with less trial and error. As a result, it is expected for Optimal Dynamics to gain new freight customers in Japan.

Venture Capitals and investors that have invested in Optimal Dynamics so far

[Seed, Jul 2017] -$4M
Fitz Gate Ventures

[Series B, Apr 14, 2022] -$33M			
(Lead) Timothy Wang, The Westly Group	Nicholas Wheeler, Standard Investment	Mike Droesch, Bessemer Venture Partners	Paul Jordan, Activate Capital Partners

[Seed, Jul 2020] -$4M					
(Lead) Mike Droesch, Bessemer Venture Partners	TenOneTen Ventures	The Westly Group	Fitz Gate Ventures	Embark Ventures	Newark Venture Partners

[Series A, May 13, 2021] -$18.4M							
(Lead) Mike Droesch, Bessemer Venture Partners	The Westly Group	Ten One Ten Ventures	Fitz Gate Ventures	Embark Ventures	Fusion Fund	John Larkin	John Hess

Detailed Information (as of Dec 26, 2023)

Name	Location	Year	Product	Customers	Management	Funding	# of Employees
Optimal Dynamics	NYC	2017	One Platform • Plan • Execution	• Well-known Fortune 500 shippers • 50-truck, middle-market for-hire carriers Standard logistics, Schneider National, Norfolk Southern, etc.	• Daniel Powell, CEO & Founder • Warren Powell, Co-Founder & Chief Analytics Officer, Professor Emeritus Princeton University	$33M Series B in early 2022	50-80

SWOT Analysis

SWOT Analysis: Optimal Dynamics	
Strengths	Weaknesses
• AI technology of 40 years of research and development at Princeton University. • Having rapidly built a diverse customer base that includes small and middle-market for-hire carriers, as well as well-known Fortune 500 shippers. • Actively uploading a range of content on social media channels like YouTube and LinkedIn, including tutorials and lectures, to attract new customers.	• Customers may initially resist the change brought about by Optimal Dynamics' One Platform. • Given that Optimal Dynamics received Series B funding in April 2022, it may require additional investment in the second half of 2023 to support more aggressive hiring efforts.
Opportunities	Threats
• Global expansion: Optimal Dynamics has helped two large European container shipping companies grow their freight trucking operations in Asia.	• Potential startup investment slowdown due to the SVB financial crisis in 2023