Syllabus

OIDD 236
Scaling Technology Ventures: Aligning Operations with Strategy

Class Schedule and Room
Tuesdays and Thursday 9:00am-10:30am: Over
Zoom

Instructor
Gad Allon
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Course Overview
The course is designed for students who plan to join rapidly growing ventures, who are preparing to scale their own ventures, or who plan to evaluate such ventures through the lens of investors or consultants.

THE GOAL OF THIS COURSE is to make strategic scaling decisions that are grounded in operational reality. The course adopts the perspective of the manager and functional leaders in growing ventures and organizations and explores issues that leaders and managers encounter after a firm achieves product-market fit.

We will approach the challenge of scaling by taking a holistic view that incorporates competitive strategy, financial evaluation, and the customer experience. We focus on decisions and challenges that many firms that try to scale their operations face with the focus on assessing the readiness of the firm to scale, and the required steps to scale. In particular, we will discuss whether the firm needs to reformulate its strategy; whether the firm should build competencies in-house (for example, by investing in a portfolio of assets) or buy them (for example by developing and implementing a network strategy working with external suppliers and stakeholders) and the risks associated with scaling these. We will also discuss the organizational implications of scaling focusing on designing the organizational structure and culture for growth, all while managing the challenges within and across the product, engineering, sales, marketing and sales functions.

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Course Materials

All course materials are either downloadable from Canvas or will be delivered over ForClass. ForClass is a platform that allows you to read cases and submit responses to basic questions that then will be used to enhance the discussion in the class.

Course Requirements and Grading

Course grades will be based on class participation (15%), Group and individual case studies (30%), white paper (15%) a midterm exam (20%), and a final exam (20%).

Class Participation

One half of this grade will reflect basic measures of participation. On-time attendance is mandatory. You are expected to do the pre-assigned readings and to be prepared to discuss the readings in class.

The other half reflects my qualitative judgment concerning your effective contribution to class discussions and dynamics. You should be attentive to the class discussion. Your comments should respond to and "push forward" what is happening in class.

Case Write-Ups

There are 4 case write-ups (Peapod, PCS, PharmaFlex and Mexico China), which should be done in groups of 4, and two mini cases (Network Fleet and SolarBacks) which should be done individually.

For each case, I will post on ForClass a set of questions to be answered. Your group may answer the questions one at a time. While there is no need to write up the case as a memo, your answers to case questions should be crisp and complete. I will judge your answers based on the depth, clarity, and care with which you present them.

Answers based on *quantitative analysis* should include summary charts or tables that are sufficient to communicate your findings. They should not describe each analytical step. Rather, for each analysis you should include this type of detail in an appendix. *Qualitative questions* are often open-ended. Your analysis here should be thorough in its treatment and succinct in its description or explanation of individual points.

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White Paper: Term Project

The goal of the project is to use the tools and concepts we discussed in class to better understand firms' attempt to scale or ability to scale. You should perform the analysis on a company and use the class lessons to explain variations across years or decisions the firm made.

Steps:

1. Pick a firm that you can collect some data about from financial statements, as well as other sources (all public and private sources are legitimate).

2. Discuss the scalability of the firm's business model and the scalability constraint it faced or may face.

3. Identify the main operational and marketing metrics required to assess its scaling over time. Explain variations over time.

4. Identify changes in the firm's operations as it was scaling, based on what we discussed in class (increase in number of sku's, lean implementations, changes in global supply chains, etc) and see how they are being reflected in metrics and their impact on the financial viability and customer economics of the firm.

5. Discuss whether the model has demonstrated the scalability you discussed in (2) and how it is reflected in the KPI's.

6. Write a short report, up to 8 pages of text and 4 pages of exhibits.

Exams

A closed book midterm will cover the tools and concepts discussed until the midterm. A closed-book exam will cover the tools and concepts developed in class. The exam is scheduled for Friday, May 8th, 12-2pm.

While you may prepare in groups for the exams, the notes you use during an exam must be your own. Similarly, the work performed on the exam itself must be your own.

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Class Schedule

Below is a summary listing of class topics and the due dates for case write-ups. To prepare for a given session, you should go to Canvas and follow the appropriate link for instructions for the given class.

Session	Topic	Due
1	**What is Scaling:** Introduction	
2	What is scaling: The Operating system	
	Ready?	
3	**Readiness to Scale: Where** to Scale: Differentiation, Alignment and Scalability	StirEdu (Read and Prep)
4	**When** to scale: Financial View of Operations: Metrics for scaling	
5	Investor/External perspective	Peapod Case (Group)
6	Process Measures for scalability	
7	Process Level Metrics	PCS Case (Group)
	Able?	
8	**How to Scale: Assets** Risk and Capacity Strategy	Network Fleet Case (Individual)
9	Managing Assets for growth	
10	Asset Types and Flexibility	PharmaFlex Case (Group)
11	Asset Types and Flexibility	
12	**What** pace to scale? Managing capital requirements	ReffP (Read and Prep)
13	**Midterm**	

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	Propelled?	
14	**Why Firms Scale: The Physics and Economics of Scaling:** Introduction to supply chains scaling	
15	**How to Scale Supply chains:** Dealing with Uncertainty: Safety Inventory	
16	**Pooling: Centralization and Scaling supply chains**	
17	**Speaker**	
18	Scaling Variety in supply chains	SolarBacks (Individual)
19	**How to Scale Services**: Queueing Systems	
20	Scaling Service Systems	
21	Scaling global networks (simulation game)	Mexico China game (Group)
22	Managing global networks (Debrief)	
23	**How to Scale Platforms:**	Friendster (Read and Prep)
24	Scaling two sided markets	Catalant (Read and Prep)
25	**How to Scale People and Processes** House Building Game	House Building Game
26	Paradigm of Lean Operations: main tools	Paradigm of Lean Operations
27	Paradigm of Lean Operations: Continuous improvement	Pal's Sudden Service (Read and Prep, not graded)
28	The role of the founder	Careem (Read and Prep, not graded)
	Wrap-Up and Review	

Discussion board

In this course we will use a new type of discussion board, developed by ment.io

Each student is required to participate in each discussion initiated by the instructor (there will be one per week). Participation can be done by either agreeing, disagreeing, voting or offering an alternative answer. A detailed email with explanations on how to enroll and patriciate will be sent a few days into the semester.

More Detailed Description for the Curriculum Committee

Module 1: What is Scaling

Class 1:   What is Scaling: Introduction: Why is the course relevant today? What is scaling (and how is it different than growth)? What are the main challenges and risks firms face as they scale

Class 2:   **What** is scaling? We will discuss the key scaling decisions, questions and the key high-level metrics related to both consumer economics and financials. We will outline the key components of the operating system and how they pertain to scaling. We will also explore the main business model drivers that encourage (rapid) growth and how they are related to the notion of scaling. Finally, we will introduce the main framework to test for readiness to scale.

Module 2: When (and where) to Scale

Class 3:   **Where** to scale: we will discuss the key question of "readiness-to-scale: ability to differentiate, ability to continue and deliver value and ability to scale. We will stress the need to model the scalability of each market segment in order test in what direction should the venture grow.

Prepare: Read the StirEdu case on ForClass and submit your responses on the platform. This should be done individually.

Class 4:   **When** to scale: Introduce the notion of "Readiness to Scale" and explore the financial and consumer related aspects of it. We will develop a framework tying operational and marketing data together with personal estimates and projections of key resources and process to assess the readiness of the firm to scale. The main objective is to understand how to identify key scaling metrics.

Class 5:   **When** to scale: We will use the Peapod case as our main discussion vehicle to discuss readiness to scale and apply the frameworks we discussed until now. The main objective is to understand the critical operational capabilities needed to scale and the metrics needed to measure these.

Prepare: Prepare the Peapod on ForClass and submit your responses on the platform.   This a graded group submission.

Class 6:   Scaling and Process Measures: Introduce the fundamental process measures throughput, inventory and flow time, and Little's Law, the key relationship among the three.

Class 7:   Process Level Metrics: Discuss where and when to scale using process flow charts and fundamental process performance measures.

Prepare: Prepare the PCS case on ForClass and submit your responses on the platform. This is a group submission.

Module 3: How to Scale: Assets

Class 8:   **How** to scale: assets We will discuss the critical operational capabilities required to scale: the ability to deal with risk while remaining agile. We will explore the need to invest in a portfolio of assets and understand what makes a portfolio scalable.

Prepare: Read the Seagate case on ForClass and answer the questions. This is an individual case.

Class 9:   **How** to scale assets Understand the need to model risk and data-driven capabilities and understand how should ventures scale while hedging against risks.

Class 10, 11: Should we invest in specialized or flexible capacity? Once a company decides it needs to build new capacity, it must decide on what type of capacity. This involves deciding on the type of technology and facility. This class will discuss when and why product-dedicated or product-flexible technology is more appropriate. We also will explore what flexibility means and the various approaches to achieve it and be better positioned to respond to changes in demand, supply or processing.

Prepare: Prepare the PharmaFlex case on ForClass and submit your responses on the platform.   This is a group submission.

Class 12: What's the right pace to scale?
Understand the main risk of cash burn and capital requirements and understand the tradeoff between growth and financial return and viability. We will discuss to build a basic (yet detailed) model for a SaaS business and test different hypotheses on the scalability.

Prepare: Prepare the REffP Case on ForClass and submit your responses on the platform.   This should be done individually.

Class 13: Midterm

Module 4: The Physics and Economics of Scale (Why Firms Scale)

The next several classes will explore the main drivers of economies of scale in operational systems.

Class 14:   Economies of Scale & Cycle Inventory. Introduction to supply chains and their unique scaling challenges. Discuss how to manage fixed costs in such systems and exploit economies of scale.

Class 15:   Uncertainty, Safety Inventory & Pooling. Discuss forecasting characteristics and how to manage safety inventory to protect against uncertainty in demand and/or supply lead times. Discuss the concept of inventory "pooling" and its role in supply chain design. Discuss the implications of these for scaling ventures.

Class 16:   Pooling: Centralization & Postponement. Discuss different pooling methods, particularly physical and virtual centralization, their pros and cons, and implications for supply chain design.

Class 17: Speaker

Class 18:   Scaling Variety in supply chains: We will discuss how ventures should scale the number of product variants without adding complexity. We will discuss the concepts of modularity, postponement and commonality.

Prepare: Read the SolarBacks mini-case on ForClass and answer the questions. This is an individual mini-case.

Class 19:   Queueing Systems. We will discuss the unique challenges of managing service systems. What are the key tradeoffs faced by service firms.

Class 20:   Scaling Service Systems: Discuss the different ways in which service systems scale and their challenges.

Module 5: How to Scale Global Networks

Class 21:   **How** to scale a global supply network: Which factors should be considered when designing a global operational network and what are the main challenges in scaling these. Understand the challenges in forecasting demand for a scaling firm. We will discuss the challenges in running a growing supplier chain or network and understand how operational metrics such as *total landed cost* help making such decisions when scaling the firm's supply base.

Prepare: We will play an in-class simulation game. The objective is that each group identifies how to best manage a global network and the key challenges faced in such a setting. The assignment for the in-class simulation game will be discussed and handed out in the previous class. This a graded group submission.

Class 22:   **How** to scale: global supply base: Understand the main challenges faced by ventures that rely on supply chains by discussing the Mexico China game. Discuss the main tradeoffs faced by ventures that manage a growing supplier network. Understand how to build a supply chain that scales (and the emphasis on global networks).

Module 6: How to Scale Platforms

Class 23:   **How** to scale: platforms: Understand the shift from asset ownership to orchestration. Discuss the unique challenge of choosing the right pace of scaling a platform. What are the factors that motivate firms to pursue or avoid accelerated growth strategies in such settings? Explore the unique scaling metrics of a platform.

Prepare: Read the Friendster case on ForClass and submit your responses on the platform. This should be done individually.

Class 24:   **How** to scale: platforms
Understand that network effects and their strengths vary across platforms. Explore how to manage a shift to top-down enterprise selling, especially the impact on product and company culture. Recapitulate analysis of whether/when to focus on accelerating growth in core business vs. diversifying in new directions in a context of a two-sided market.

Prepare: Read the Catalant case on ForClass and submit your responses on the platform. This should be done individually.

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Module 7: How to Scale People and Process

Class 25: House Building Game. Explore the relationship between process structure and performance (cost, quality and time) through a team-based simulation game. Appreciate the human side of scaling processes.

Class 26: Paradigm of Lean Operations. Introduce, drawing on your house game experience, the paradigm of lean operations with its focus on attaining an ideal process through waste reduction. Every organization must build capabilities for future growth. Such capabilities include processes for new product and process development. We will discuss "learning by doing" through lean operations and compare to "learning before doing" in operations.

Class 27: **How** to scale: people and organizations: We will discuss the organizational challenges that firms face when they begin to scale rapidly. In particular, we will discuss the balance between growth, people hiring and process streamlining. We will discuss the role of processes and the interaction between processes and culture in an operationally driven market.

Prepare: Prepare the Pal's case on ForClass and submit your responses on the platform.

Class 28: **How** to scale: role of the founder
Indicate how scale changes the role of a founder/CEO. Discuss the need to modify reporting structures and clarify decision rights as the organization grows with focus on central versus local decision rights. Emphasize the importance of culture, communications and other soft interventions to mitigate the effects of structural changes.

Prepare: Prepare the Careem case on ForClass and submit your responses on the platform.