Northwestern | Kellogg

Entrepreneurship KIEI 932
Product Management for Technology Companies:
An Entrepreneurial Perspective
Spring Quarter 2018
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Overview

Two defining characteristics of the technology industry are its dynamic nature and the inter-connected nature of technology products and services. This results in a continuous need for new products—and for managing all of the aspects of discovering, designing, developing, supporting and making money from these products. In technology[1] companies, the Product Management organization is responsible for the "inbound" product development activities as well as "outbound" product marketing activities: discovering customer needs, defining product requirements, orchestrating the development of products and solutions to address these needs, taking new products to market and managing products over their life cycle. In a technology startup, a Product Manager is often a co-founder of the firm. Larger technology firms have a specialized Product Management organizations consisting of various types of product manager roles, including Product Managers Product Marketing Managers, Product Planners and Program Managers.

This course equips students with the frameworks, tools and direct experience to become effective product managers. The course focuses equally on product management in technology startup firms and product management in large technology firms. Students will gain hands-on experience via an industry-sponsored project and targeted cases—including several cases developed specifically for this course.

1. Learning objectives

The overall goal of the course is to prepare students to become effective product managers and product marketers in a startup firm or in a larger technology company by developing:

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[1] In this course, we will focus primarily on Information Technology firms, because the IT industry has unique characteristics, such as the importance of platforms and ecosystems, which are not as relevant in other technology domains like bio-tech and clean-tech.

- A comprehensive understanding of the **role of Product Management** in a technology company and the **responsibilities** of Product Managers in various contexts, considering product characteristics, industry, firm size and market maturity.
- A firm grasp of the **strategic frameworks** and **tactical tools (deliverables)** that form the foundational skills for product management.
- The ability to apply these product management skills in real-life business situations.

Specific learning objectives

1) Source and evaluate market opportunities for new technology products. Develop a product strategy and product vision for viable opportunities, based on corporate objectives, capabilities and resources, market trends, technology feasibility, etc.

2) Manage the iterative *product discovery process* to discover, define and prototype a *Minimum Viable Product* that will capitalize on the opportunity. Articulate market requirements associated with the Minimum Viable Product for Engineering and the broader cross-functional Product Team.

3) Assess and design a business model for a product that will optimize revenues and profitability of the product over its life cycle

4) Manage and lead a cross-functional product team, typically without direct authority

5) Develop and execute a product launch plan to take new products to market and drive customer adoption of new products

6) Deliver a "whole offer" that solves a complete customer problem and delivers a compelling customer experience. Design and build an effective partner ecosystem to deliver the desired customer experience.

7) Build a product portfolio to balance risk and return and manage product lines to optimize revenues and profits

8) Manage products as a business on an on-going basis. Drive growth through sales expansion, customer base extensions and product extensions. Manage sun-setting of products at the end of their life cycle

9) Manage the growth and evolution of products and product management from the seed stage to the exit stage in a startup firm.

10) Understand the role of products in professional services firm. Manage the productization of services by leveraging automation and analytics. Shift to consumption-based and value-based monetization models for services.

2. Design Principles:

This course has been designed with the following principles in view:

- The **entrepreneurial perspective**, whereby product managers battle against high odds and deal with high-risk situations

- The **general manager perspective**, whereby product managers think of their products as a business and combine product knowledge with business expertise to drive success.

- Grounded in **actionable frameworks and tools** that product managers can use on their jobs

- **Learning by doing**, through cutting-edge case studies and a company-sponsored project

- **Analytical rigor** and data-driven decision making

- **Continuous improvement**. This course will continue to evolve and improve over time.

3. Pedagogical Style
The pedagogical style will be a hybrid of lectures, cases and guest speakers. The cases and examples chosen for the course will focus on product management topics within informational technology firms.

4. Required Course Materials
The only required materials for the course are the case packet and the materials posted on Canvas. Class notes and assignments will be available for download from the Canvas site for the course. This class is a fully paperless class. All course readings, lecture presentations and assignment submissions will be uploaded electronically in Canvas. ***The class notes are the intellectual property of the instructor. You may not distribute or duplicate these notes without my written consent.***

5. Student Expectations
I expect every student to be *present, punctual, prepared,* and *participative* in all class sessions. Attendance is mandatory for all regularly scheduled class sessions, including the guest sessions. Absence from any class session without prior notification will severely affect your class participation grade. I find late arrivals and early departures from a class session to be very distracting and disrespectful, so please arrive on time, and stay for the duration of the class.

Students are expected to be prepared with the assigned readings and cases for each class. I will "cold call" on students to present or defend your viewpoint on the assigned readings or the case, so please be prepared.

Every student is expected to contribute to class discussions. Do not expect to do well in this course by simply coming to class, taking notes, and synthesizing, recalling, or reproducing the material we cover in class. To do well, you must learn from **active participation** in class discussions. In evaluating class participation, I emphasize the **quality** of participation a lot more than the **quantity**. I try to assess how your contributions enhance both the *content* and *process* of a discussion:

- Do your comments merely restate the facts or do they provide new insights?
- Do the comments add to our understanding of the issues or are a frivolous attempt to get "air time"? (i.e., you have only one thing to say, and want to say it no matter how irrelevant it is to the on-going discussion!).
- Are the comments timely and linked to the comments of others?
- Are the comments action-oriented, or simply descriptive statements?
- Do the comments move the discussion along by giving a new perspective?
- Are the comments clear and concise, or obscure and rambling?
- Do the comments reflect a concern for maintaining a constructive and comfortable classroom atmosphere?

6. Laptop Policy

You may use laptops, tablets or smartphones in class *solely for taking notes.* Using electronic devices for any other purposes (including checking your email or checking into social network sites/apps) is strictly forbidden. If you see any student violating this rule, you are obliged to report this violation as a part of the Honor Code for this class.

7. Assignments and Grading

The assessments in this course are designed with the following goals in mind:

- Frequent and lightweight assessments
- Individual as well as team accountability
- Peer as well as instructor-based assessments

Assignments will be a combination of team and individual assignments:

Team Case Assignments (4% each, for a total of 20%):

- Tablet Teach Case
- Amazon Kindle Fire Case
- Motorola Droid Case
- vMock Case
- Kheyti Case

Team Project – Product Management in Action (35%)

This will be a client project that you will do as a team over the 10 weeks of the course. More details of the project follow later in this document. The project will be evaluated in phases:

- Client Brief (5%)
- Mid-Course Checkpoint (5%)
- Final Report (25%)

Individual Assignments (5% each, for a total of 20%):

- What makes a good Product Manager (Video Assignment)
- Business Model Assessment and Critique
- Product Management Tools in Action – Wireframing Assignment
- Evaluating a Go-To-Market Plan

Individual Reading Assignments (1% each per week, for a total of 10%)

Every week, you will be required to read assigned articles and respond to a simple question from the readings to ensure that you have done the reading.

Class Participation and Attendance (15%)

Attendance will constitute 50% of the score and participation will count for 50% of the score.

8. The Product Management in Practice (PMIP) Project

The Product Management in Practice (PMIP) project is a key component of the learning experience in this course, so 35% of the course grade will be determined by this project. The purpose of the PMIP Project is to:

1. Gain hands-on experience on how Product Management works in the real world
2. Deliver value, by way of insights and deliverables to project sponsors and their companies
3. Create a case study that may be used in future years in this class.

To ensure a consistent experience on the projects and to create a spirit of competition, we will have multiple teams working with a client firm on the same business problem. We have signed agreements with 5 client companies and have asked each company to propose a business problem. These companies and their business problems are:

- **Best Buy**: Best Buy's Chief Growth Officer has identified the home health care market as an opportunity for the company to drive growth and diversification. Best Buy wants to leverage its store presence and the Geek squad service personnel to enter the market for home health care services. The project will involve analyzing the reasons behind the limited success of the initial offering and recommendations for the offering and ecosystem that will drive success for Best Buy in this market.
- **Robert Bosch LLC**: Bosch is embarking on solving the problem of mobility for the urban population in the future, when a majority of vehicles will be autonomous and the behavior and usage of transportation services will be very different. Bosch is a leader in sensors and IoT as well as in automotive components. The project involves analysis of consumer mobility trends and design of a mobility offering that will address the transportation and mobility needs of urban consumers in the future.
- **Sprinklr**: Sprinklr is the first unified customer experience management platform that allows enterprises to reach, engage and listen to their customers for marketing, care and commerce. Recognizing the importance of customer care, Sprinklr has created a customer care platform. The project involves the design of the product launch and marketing strategy for this platform.
- **Honda** – Honda is examining the opportunities for Emotional Artificial Intelligence (AI) in automobiles in the year 2030. Emotional AI will analyze driver and passenger emotions based on physical and gesture measurements and will take actions to adapt the automobile experience to improve their well-being. The project involves understanding how to detect emotional states, how to define ideal emotional sates and to identify actions that the system should take to reduce stress, create a sense of confidence and encourage safe driving behaviors.
- **Reliance Jio** – Reliance Jio Infocomm is a greenfield digital services company that has disrupted the Indian wireless industry since its launch in September 2016. Jio has acquired 160 million subscribers and is the world's largest wireless network, carrying more data traffic than all the U.S. service providers put together! Jio is now looking to enter the Small and Medium Business (SMB) market with an end-to-end digital services solution as well as the fixed broadband business (Fiber to the Home or FTTH). The project will involve designing the Go-to-Market Strategy for these opportunities.

Please note that the companies and the business problems are subject to change.

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Each client firm will have 4 to 5 teams working with them. You will be asked to submit your preferences for the projects and you will be assigned to a project based on your interests, backgrounds and the interests of your colleagues. Client firms will assign specific coaches for each team. Teams will be mentored by Ganesan Keerthivasan (ganesan.keerthivasan@zealstrat.com) in terms of the client interactions/expectations and by Pallavi Goodman (p-goodman@kellogg.northwestern.edu) in terms of the academic deliverables. Ganesan is the Program Manager for the PIMP projects and Pallavi is the official TA for the course. I will also meet the teams at various points during the quarter to review the progress.

In the final week, we will schedule client presentations with senior executives from the client firms. There will be prize money for the winning student teams for each client firm.

We are excited to offer this unique experiential learning opportunity to students this year and we hope that it will be a challenging and exciting experience.

9. Teams

By the end of the first week of class (Friday, April 6, 2018), students will need to form teams of not more than six members for all team-based assignments, including the PMIP Final Project and the Tool in Action Assignment. Students may create teams of their choice. Team names and composition are due at *the second class meeting*. Prior to the start of the third class meeting (Tuesday, April 10, 2018), we will assign projects to teams.

10. Attendance Policy

I would like you to attend all classes barring emergencies, but I understand that you may have pressing commitments. Keeping this in view, you are allowed to miss a **maximum of two class meetings during the quarter**, after informing me in advance about your intended absence. If you miss any sessions beyond the permissible 2, you will lose 5% of your grade for each additional class missed, subject to a maximum of 15%, even if you inform me in advance. If you miss a class without informing me in advance, you will automatically lose 5% of your grade, subject to the maximum of 15%. To allow me to track attendance, I will circulate attendance sheets in every class. It is your responsibility to sign the attendance sheet in each session.

11. Peer Evaluations

This course requires a tremendous amount of team work, so your contribution to the team effort is vital. I will conduct a peer evaluation at the end of the course to allow team members to provide feedback on the contributions of each team member to the team assignments and projects. If your peer evaluations indicate that you did not contribute your fair share of effort, you may drop one or more letter grades in the course.

12. Honor Code

All students are expected to abide by the honor code of the Kellogg School and Northwestern University. The honor code will apply as follows:

- The written assignments may not be discussed with anyone outside your group, or with other students in the program.

- For the PMIP team project, students may not discuss any *client-specifics* with any student outside your group. Students may discuss *general topic material* in relation to the project with students outside your group.

- Technology Product Management is inherently business-critical and forward-looking. Under no circumstances shall a student share confidential or proprietary information with anyone outside the group (myself included) without express written consent. If confidential information is to be shared by the client with the group, students shall sign the appropriate non-disclosure agreement. Students shall also pro-actively notify client of any potential conflicts (former employee of a competitor, or may be working for a competitor after class).

- The individual assignment may not be discussed with anyone at all.

- Students may not use any electronic device in class sessions for any purpose *except* to take class notes. Violations will result in immediate ejection from the class.

13. Course Content

Module 1 - Overview of Product Management
We will kick off the course with an overview of the multi-faceted role of product management in technology companies. We discuss what product managers do, what they are expected to know, what they are accountable for and what factors determine a high-performance product manager and product management organization. We introduce the core building blocks for product management that will form the basis for the remainder of the course. In the second session for the week, we will invite a distinguished panel of senior product managers to share their experience "from the trenches". This will give students a good opportunity to experience "life as a PM" through professionals who have spent long careers as product managers or have founded companies.

Module 2 – Assessing Product Opportunities
Opportunity Assessment answers two key questions, "How do we source and identify opportunities?" and "Which opportunities should we invest time and money in?" In this module, we will analyze three dimensions of Opportunity Assessment – Product-Market fit, Product-Company fit, and Product-Business fit. We will discuss the "Jobs to Be Done" framework to define key unmet needs and hence the opportunities for a new product. We will discuss how to organize the opportunity analysis into a recommendation and present the output in an Opportunity Brief. The Opportunity Brief serves as the "business case" for the product and should explicitly provide a "Go/No-Go" recommendation to invest resources and initiate the Discovery process for a specific product (or not).

Module 3 – Discovery & Requirements Definition
After identifying the target product opportunity, the product manager leads an iterative process to *discover, define/ refine and prototype a* 'M*inimum Viable Product' (MVP)* that will capitalize on the opportunity—or identify a better opportunity (a 'pivot'). This discovery and requirements definition process is at the very core of the PM's job because these early product decisions typically define a product's ultimate business success, failure or mediocrity. The primary output from this process should be a customer-proven prototype tested for *functionality*, *usability* and *business*

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viability. We will discuss the iterative process in getting to the MVP and building a customer-proven prototype. We will also discuss how to describe requirements in the form of user stories and a Market Requirements Document.

Module 4 – Business Model Design
The business model is the mechanism by which the firm generates revenues and profits from a product, service or solution. Technology companies are often better at value creation than value capture. Many startups fail because they are not able to effectively monetize the value that they create for customers. PM's are best positioned to evaluate product, customer, competitive, operational and business inputs to define an effective business model. We will discuss frameworks for defining and diagnosing a business model and we will review popular revenue models for technology products and services (e.g., advertising, subscription, Freemium, etc.). We will conclude with a discussion on business model innovation and how technology startups can change the game with innovative and disruptive business models.

Module 5 – Structure, People and Process in Product Management
Having considered the product and business model definition, we will focus on the "softer side" of product management – the organizational and people issues in effective product management. We will begin by addressing the *structure* of Product Management organizations and the most common organizational design models for product management. We will then address the *process* of Product Development and Management by understanding the difference between traditional Waterfall development and Agile development methodologies. We will discuss how to manage development projects using agile methodologies like Scrum. Finally, we will address the *people management* aspect of the PM's role – how to influence teams without direct authority and how to run meetings effectively. Through a role-playing case study, we will place students in a real-life situation where a Product Manager has to orchestrate a cross-functional team through a crisis.

Module 6 – Taking Products to Market
Product Launch and Product Marketing can make or break a product in in the market. In this session, we will focus on the Go to Market (GTM) strategy for a new product. This includes the planning and execution of the Product Launch plan, developing the Positioning and Messaging Framework, developing all marketing collateral and supporting the sales team on strategic client meetings and sales efforts. It also involves choosing the routes to market for the product and execution of the launch activities in collaboration with the sales, channel and partner organization. We will discuss the end-to-end process of designing and executing an integrated marketing communications plan and leveraging digital and social media to create awareness and drive adoption of new products.

Module 7 – Managing Whole Offers and Partner Ecosystems
A stand-alone technology product rarely solves a complete customer problem. Mainstream customers expect technology companies to create "Whole Offers", which include the core product as well as all the complementary products, services and information needed to create a satisfactory Total Customer Experience (TCE). To create this "whole offer", technology companies need to assemble an ecosystem of partnerships and alliances that complement and enhance their core product. In this module, we will begin by defining the Whole Offer and the Total Customer Experience. We will look at how the Whole Offer evolves over time as the product becomes more widely adopted in the marketplace and as customer needs evolve. Next, we will discuss how to assemble the capabilities needed to deliver on the Whole Offer by considering "make, buy or ally" approaches. We will discuss how to create and manage a robust ecosystem of partnerships.

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Module 8 – Product Planning: Roadmap Design & Portfolio Management
Technology products tend to evolve quickly over time and single products tend to proliferate into diverse product lines. Therefore, product managers need to proactively plan the roadmap for the evolution of products *over time* as well as the relationship among products *across the portfolio.* In this module we will focus on decisions related to the Product Roadmap, steps in roadmap planning, and alternative approaches to product roadmapping. We will also look at Product Portfolio Management decisions, which include managing multiple products within a product line and across product lines so they map logically to customer segments, vertical markets, price points, strategic objectives and other factors. We will consider portfolio management decisions such portfolio expansion, portfolio pruning, portfolio balance and mitigating sales cannibalization across the product portfolio.

Module 9 - Product Management in Startup Firms
In this module, we will focus on the evolution of products and product management in a startup firm, all the way from its founding to the exit stage. We will discuss the product management issues that arise at each of the five stage in the life of a startup – founding stage, seed stage, persevere stage, scaling stage and the exit stage. We will organize the issues into 5 areas – Customer evolution, product evolution, business model evolution, channel evolution, marketing evolution and organizational evolution. We will focus on the challenges in scaling a startup firm beyond its initial success and growth.

Module 10 – On-Going Product Management
Product managers need to do more than bring new products to market. They need to manage the products as an ongoing business over time. In this module, we examine this process of on-going management of products over their life cycle. We will discuss three dimensions of ongoing product management – managing sales growth, managing product evolution and managing ecosystem evolution. To drive sales growth, we will consider three pathways to growth – increasing share of wallet, increasing share of market an expanding the size of the market. In managing product evolution we will consider business activities like customer support, bug tracking/ fixing, next version planning, product enhancement and end-of-life (EOL) management. In managing ecosystem evolution, we will consider both vertical and horizontal dimensions of the ecosystem. We will conclude with a discussion of metrics and methods for diagnosing and monitoring product performance.

Module 11 – Product Management in Professional Services Firms
Professional services firms often find themselves in a "linearity trap" –their revenues grow linearly as they increase their headcount. This is in sharp contrast with product-centric firms like Google of Microsoft, where variable costs are very low and margins expand greatly with scale. To get to nonlinear growth, professional services firms (lawyers, consultants, accountants) need to productize aspects of their service offerings by leveraging automation and analytics. In this session, we will see how to "put products into services" and how to manage productization of services. We will also examine the need to develop alternative business models for monetizing services, to allow services firms to capture the value created by productization. This session is very relevant for students embarking on consulting careers.

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14. Session Schedule

Session	Day and Date	Lecture/ Case/ Speaker	Lecture Topic/ Case Title/ Speaker
1	Tue, Apr 3	Lecture	Overview of Product Management
2	Fri, Apr 6	*Guest Speakers*	Panel: "My Experiences as a Product Manager"
3	Tue, Apr 10	Lecture	Assessing Product Opportunities
4	Fri, Apr 13	Lecture	Discovery and Requirements Definition
5	Tue, Apr 17	**Case**	***Tablet Teach Case: Opportunity Analysis for a New Educational Technology Product***
6	Fri, Apr 20	Lecture	Business Model Design
7	Tue, Apr 24	Case	***Amazon's Kindle Fire***
8	Fri, Apr 28	Lecture	Structure, People and Process in Product Management
9	Tue, May 1	**Case**	***Motorola DROID 2: The Product Manager's Dilemma***
10	Fri, May 4	Lecture	Taking Products to Market
11	Tue, May 8	**Case**	***Saama: Go-to-Market Strategy for Clinical Analytics***
12	Fri, May 11	Lecture	Managing Whole Offers and Partner Ecosystems
13	Tue, May 15	**Case**	**Kheyti: Product and Business Development for an AgTech Startup**
14	Fri, May 18	Lecture	Product Planning and Strategy
15	Tue, May 22	Lecture	Product Management in Startup Firms
16	Fri, May 25	**Case**	**vMock Inc.: Pivoting to Succeed and Scale in a Technology Startup Firm**
17	Tue, May 29	Lecture	Ongoing Product Management
18	Fri, Jun 1	**Case**	**OnePlus: Crossing the Chasm in the Smartphone Market**
19	Tue, Jun 5	Lecture	Product Management in Professional Services Firms
20	*Wed, Jun 6**	***Presentations***	*Client Presentations – Product Management in Practice Project*

*Make-up Class in lieu of Friday, June 8 class session