"What Counts" for Success:

Understanding the Role of Product Manager and the Implications for Teaching Design Engineering Students

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Abstract

The role of Product Manager within industry is a driving force of innovation. Product Managers are trained as individual contributor engineers, yet evolve into multi-functional managers who lead the business, often through on-the-job training. Drawing on 17 in-depth interviews with Product Management practitioners and recruiters across a range of businesses, a collection of "what counts factors" emerged for success in this position. These characteristics, in turn, are used to define a workshop intervention to better prepare design engineering graduate students to face the challenges of the Product Manager role and succeed.

I.   Definition of a Product Manager

A *Product Manager* is described as a classically trained engineer who works at the nexus of technology development and business management. They deliver the product offering by leading activity that interprets customer needs, shapes technology development and generates bottom-line business results. Product Managers often work in tandem with design engineers and translate customer requirements into product and service offerings.

II.   Research Design and Results

The research is descriptive, involving 17 in-depth interviews with a cross section of managers who are familiar with the Product Manager role. The subjects were actual Product Managers or they hired Product Managers and a few worked side-by-side with Product Managers in related roles. Subjects were recruited through professional contacts and had a mean 18.2 years of work experience.

An initial set of job-based skill criteria was collected from engineering-directed career-counseling books that described generic engineering roles. [1][2] This resulted in an 8-criteria "what counts factor" list, with 37 descriptive characteristics. This list was used as a guide for the interviews and was revised as more information was gathered from participants in the interviews.

The literature search and interviews identified eight skill areas that defined the role of Product Manager. The managers interviewed were asked to rank these criteria from 1-most important to 8 least important. Results are shown in Figure 1.
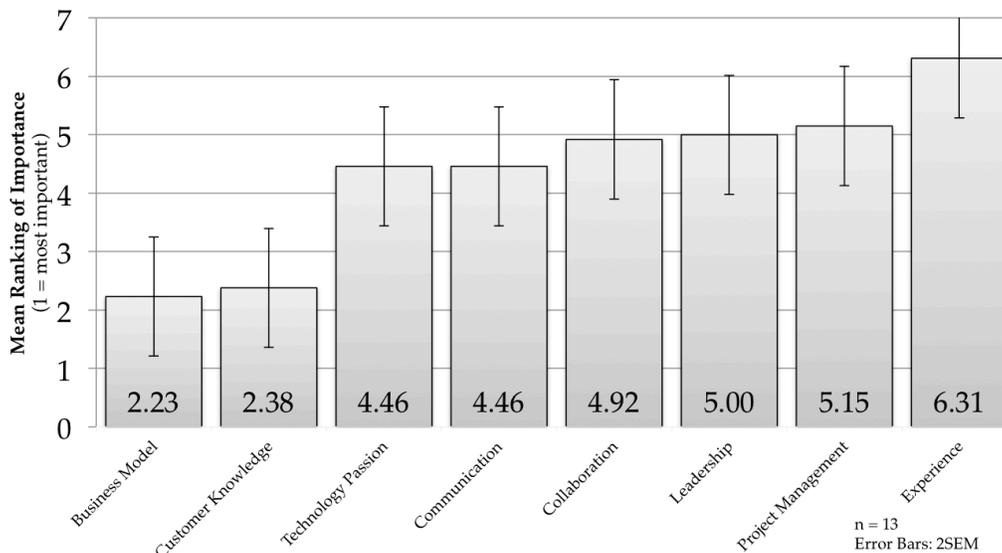
Figure 1 - Mean Ranking of Product Manager Criteria

Two distinctly non-technical criteria, Understands the Business and Knows the Customer, were rated "most important" and significant over all other factors. Two additional criteria, Passion for Technology and Clearly Communicates, also rated as relevant and important. Four criteria, Inspires Collaboration and Leadership Project Management Skills and Experience, were lower rated.

III.   Teaching Business Skills to the Technically Minded

Building on this taxonomy for the role of Product Manager, a series of workshop interventions (offered as a 1-unit ME310X: Product Management seminar) were held for a cohort of engineering design master's students at Stanford University (ME310: Global [3]) to help them explore, define and succeed in a product management role as a career path. Six 3-hour evening sessions were scheduled.

The topics for workshops were designed to accommodate the students' engagement in the parent design and innovation course and to match their schedule for looking for gainful employment after graduating their master's program, as shown in Table 1.

The first session served as an introduction to Product Management and a case study concerning a toy company business decision about choosing a product to bring to market. For each class, a manager from the workplace was invited to discuss the session topic with the students. The manager was from a business unit directly pertinent to the topic and often has an engineering background.

Session Topic	Learning Activity
1. What is Product Management?	"What Counts" Factors [4] Case Study: KLUTZ [5]
2. Leadership and Team Management	Why Teams Don't Work [6], Everest Simulation
3. Getting a Product Management Job	Resume, Interview [7], Job Finding Skills
4. Project Finance for the Technically Minded	Yahoo Finance, Case Study: Culinarian Cookware [8]
5. Marketing for the Technically Minded	Case Studies: Global Brand Face-Off [9] and Bryant Pharmaceuticals [10]
6. Business Strategy for the Technically Minded	Case Study: Crafting Winning Strategies in a Mature Market [11]

Table 1 - ME310X: Product Management course Curriculum Overview

The topic of Session 2 focused on leadership and team management skills. The main activity was a computer simulation team experience climbing Mount Everest [12], followed by a debriefing and discussion with a guest speaker who had actually done the climb. Session 3's topic was on networking, interviewing and finding a product management job. Students engaged in a resume critique and active learning interview practice. The guest was a product engineer from a local technology company recounting her job search and hiring experience.

Sessions 4 and 5 dealt with specific non-technical functions within the scope of a Product Manger. Session 4's topic was about project finance and business models that drive the major corporations and aligns with the top-rated criteria required for a successful product manager. This class also included a case study experience in a discussion with an engineer-turned-finance-manager for a major software company. Session 5's topic was on marketing and the customer experience, featuring two Harvard Business School case studies and a discussion with a senior vice president of marketing with a major computer hardware company. Session 6's topic will deal with business strategy, again referencing top-rated "what's counts" criteria and includes both a case study and a discussion with an industry professional.

IV. Future Steps

An exit post-experience survey measuring student satisfaction and gathering suggestions is underway. Next academic year, pre-post measures will be in place.

V.   Acknowledgements

VI.   References

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VII. Authors' Biographies

Mark Schar is a Ph.D. candidate studying Mechanical Engineering Design and Design Education at the Center for Design Research at Stanford University. Mark's academic interests include neurological correlates of design thinking, the neurological functioning of new product design groups, and helping young engineers transition from academic and get started in the workforce. Mark has more than 30 years of industry experience, most notably as SVP/GM with The Procter & Gamble Company and as SVP and CMO for Intuit, Inc. Mark received his B.S.S. (1975) and M.B.A. (1977) from Northwestern University.

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Micah Lande is a Ph.D. candidate studying Mechanical Engineering Design and Design Education at the Center for Design Research at Stanford University. He researches how engineers learn and apply a design process to their work. Micah's academic interests include design thinking, engineering thinking, prototyping, design learning and design cognition, engineering education and mechanical engineering design. He has helped teach human-centered design courses in the Hasso Plattner Institute of Design (a.k.a. the d.school) and mechanical engineering design classes in Stanford's Mechanical Engineering Design Group, including ME310 Global, a graduate course in design and innovation. Micah has been a researcher at the Center for the Advancement of Engineering Education, both as part of the Academic Pathways Study research team and an Institute Scholar with the Institute for the Scholarship of Engineering Education. Micah received his B.S. in Engineering from the Stanford School of Engineering Product Design program and a M.A. in Education from the Stanford School of Education Learning, Design and Technology program. Micah has also been a co-Editor-in-Chief of AMBIDEXTROUS, Stanford University's Journal of Design.

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