On the Role of Product Manager
Industry Perspective

Mark Schar
Center for Design Research
Stanford University

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/sink or swim" 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 will help define relevant curriculum that can better prepare students to face the challenges of the Product Manager role and succeed.

Keywords: product manager, product management, design leadership, success criteria

"Leadership in innovation is essential to U.S. prosperity and security. In a global, knowledge-driven economy, technological innovation, the transformation of new knowledge into products, processes, and services, is critical to competitiveness, long-term productivity growth, and the generation of wealth."

Engineering Research and America's Future
Committee to Assess the Capacity of the U.S. Engineering Research Enterprise
National Academy of Engineering (2005)(1)

Innovation has been described simply as *"invention that sells."* (2) The truth (and tension) in this definition is the necessary combination of the genius associated invention with the value generated through commercialization. In 2008, Foreign and US Corporations were granted 91.5% of the total 157.7K patents granted by the US Patent and Trademark Office, while individual inventors were granted only 8.0% of the total. IBM alone was granted 4,169 patents. (3) Innovation is a big company game.

In companies, the challenge of managing the innovation process falls to someone referred to as a "product manager." This person is typically a classically trained engineer who has transitioned into this role over time by exhibiting an aptitude for the work of innovation.

Dave Packard and Bill Hewlett are perhaps the first and best examples of Product Managers. They were both trained as engineers, brilliant (but by their own admission, not *the* most brilliant) inventors and founded a company in 1939 that became the $120B revenue technology giant, Hewlett-Packard. Packard and Hewlett spent a combined 31 years in the roles of President, CEO and Chairman of the company.(4)

In 1957, Packard and Hewlett set forth a list of "shared values" that define the company operations today. These values (in part) include: *Passion for Customers, Trust and Respect for Individuals, We Effectively Collaborate, Meaningful Innovation, Uncompromising Integrity*. (5) This broad ranging description of success reflects an understanding of the process of innovation that extends well beyond the initial work of

invention. Additional examples of engineers turned "product managers" are plentiful, including Bob Galvin of Motorola, Bill Gates of Microsoft and most recently Sergey Brin and Larry Page of Google.

However, workplace success for the "engineer-and-business manager" is far from assured. The work of product management involves many skills not always taught within a standard engineering curriculum. Learning beyond post-secondary education is often a "sink or swim" proposition filled with uncertainty and lost productivity. This is concerning for job described by the National Academy of Engineering as "essential to U.S. prosperity and security."

Definition of a Product Manager

In this research, a "Product Manager" is described as a classically trained engineer who works in a for-profit business, in a role that:

> *"… sits 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."*

This is a commonly understood role in virtually all technology-oriented businesses, from established start-ups to major, multi-national corporations. This role may be referred to as *Product Leader, Project Leader, Project Manager* or *Technical Product Manager* but the skill requirements remain largely consistent.

Product Managers are the driving force for the commercialization of innovation. They often work in tandem with inventor engineers and translate customer requirements (or needs) into product and service opportunities.

Interestingly, the "corporate social status" of a Product Manger will vary. In some organizations (mostly hardware/tangible goods, atom-based) Product Managers are the acknowledged leaders of the innovation process. In other organizations (mostly software, electron-based) Product Managers play a secondary role to the "rock star" engineer. "Rock Star" engineers (6) are tasked with exploring "what's possible" and have a breakthrough mentality, while the Product Manager (in tandem) turns these ideas into revenue and profit. In both instances, the Product Manager is considered vital to corporate success.

Method

The research process is descriptive, involving 17 in-depth (40-60 minute) interviews with a spectrum of people and companies who are familiar with the Product Manager role. In some cases, the interviewees were actual Product Managers, in other instances they hired Product Managers and a few worked side-by-side with Product Managers. The list of companies interviewed is shown in Figure 1.

Autodesk	Logitech
Bosch	Microsoft
CNH Case New Holland	Motorola
Google	Nokia
Grumman/Butkus	Procter & Gamble (2)
Hewlett-Packard	SAP (2)
Intuit (2)	Volkswagon of America

Figure 1 – *Companies interviewed. Numbers in parenthesis represent multiple interviews at the same company.*

A working set of job-based skill criteria was lifted from engineering-directed career-counseling books at Stanford's Career Development Center that described generic engineering roles. (7; 8) This resulted in an 8-criteria "what counts factor" list, with 37 descriptive characteristics. This list was used as a framework for the interviews and evolved with the interviews as more information was gathered.

The interviews began by identifying the specific role of the "product manger-type" within the organization. This was necessary because not every organization referred to the role as "product manager." Respondents were asked to keep this role in mind as they completed the interview. The next step was by open-ended questioning, asking respondents to describe "successful behaviors" of a product manager within their organization. Direct questions were used to explore specific criteria not mentioned in the open-ended portion of the interview but on the original "master list" of criteria.

The final step was a post-interview survey (n=13) to determine criteria relevance, content fit (word matching) and a forced ranking of the criteria. The survey was conducted using the Market Tools on-line survey capability.(9) Relevance was determined using a 5-point Likert-like scale (5: Crucial to 1: Not Important), content fit was measured with a 3-point triadic scale (Good: Average: Poor) and forced ranking from 1 (most important) to 8 (least important). Open-ended comments were collected for each skill area as a last opportunity to capture respondents' suggestions for improvements in wording. Statistics were compiled using Excel Office 2008, for the Mac.

Four companies provided written material describing the role of Product Manager in their company. This included job descriptions, skills assessment guides and an overview of training material. This information was included in the "What Counts Factors" in an unattributed form and is not included in this report for reasons of confidentiality.

Results

Role Definition – It was clear that all companies recognized this role within their organization and valued its contribution. There was calibration around the definition of the title for this work as the role has several labels: Product Leader, Project Leader, Project Manager, Technical Product Manager, Platform Manager, Solutions Manager. Some organizations separated the role into "in bound," which involved working with sales and marketing, and "out bound" which involved working with the designers, software architects and line engineers. However, once defined, all organizations were satisfied with the title "product manager" to generically describe the role.

The primary function of the product manager role, in all organizations surveyed, was to serve as a bridge between technical develop of products and services and the commercialization of those products and services. It was well understood that a dynamic "back-and-forth" between customer needs, product possibilities and commercial results was necessary to achieve winning business results. The Product Manager role was responsible for managing this workflow.

Skills Ranking - The literature search and interviews identified eight skill areas that defined the role of Product Manager. These criteria were confirmed and refined through the interview process. The follow-up survey provided the opportunity to measure relevance to the role, match the descriptive phrases to the role and finally force rank the skill areas by order of importance to success. Results are shown in Figure 2.

Two factors, *Understands the Business and Knows the Customer*, were rated "most important" and significant over all other factors. Four additional factors, *Passion for Technology, Clearly Communicates, Inspires Collaboration* and *Leadership*, also rated as relevant and important. Two factors, *Project Management Skills* and *Shipped Something* (a proxy for experience) were lower rated and respondents indicated these could be dropped from the list. *Project Management Skills* was maintained, as this is the work of a Product Manager, and may not have been rated highly because it considered a basic-level skill for the work. *Shipped Something* was dropped in the final version; it was included as a proxy for experience and most respondents discounted this difficult to measure and not necessary for success in the future.

Skill Factors	Forced Ranking		Relevance		Word Match v1.1	
n = 13	Avg	σ	Avg	σ	Avg	σ
Understands the Business	2.23	1.0	4.62	1.0	0.77	0.4
Knows the Customer	2.38	1.9	4.54	1.9	1.00	0.0
Passion for Technology	4.46	2.5	4.38	0.6	0.77	0.4
Clearly Communicates	4.46	1.4	4.62	1.5	1.00	0.6
Inspires Collaboration	4.92	1.9	4.00	1.9	0.77	0.6
Leadership	5.00	1.3	4.08	1.2	0.46	0.6
Project Mgt Skills	5.15	2.3	3.92	2.3	0.77	0.0
Shipped Something	6.31	2.1	4.08	2.2	0.77	0.4

Forced Ranking: 1- Most Important through 8 – Least Important
Relevance: 5 = Crucial, 4 = Important, 3 = Maybe/Not, 2 = Not Important, 1 = Not Relevant
Word Match: 1 = Good, 0 = Average, -1 = Poor

Figure 2 – *Post-Interview survey results. The survey included 25 questions; a relevance, word match and open-ended comment question for each skill factor and a final forced ranking question.*

Skills Definition – The interview process captured perspective on relevant Product Manager skills and these were translated to the working version of the "What Counts Factors." The latest version (1.2) is shown in the Appendix. The following is a discussion of each skill area, reflecting the interview commentary:

- **Understands the Business** – This was the principal skill area for success as Product Managers. The salient characteristic is captured in the first bullet point: *"Recognizes the business implications of product development decisions."* This is at the core of what Product Managers do. To do this successfully, Product Managers must have a broader view of the organization, evidenced by an understanding of the corporate strategy and how the work supports this strategy. This broader view also makes it possible to connect the pieces of the business model (technology, marketing, sales, operations, etc.) and enables commercial success.

- **Knows the Customer** – Product Managers are expected to insure that the customer is represented in all the work of innovation, from technology development through delivery. In some organizations, Product Managers fully represent the customer's voice in the innovation process. In other organizations, Product Managers are simply a facilitator of customer-interaction for the broader team. This is articulated as "everyone in the company is expected to know the customer" but in these circumstances Product Managers play a special role by "breaking ties" and driving consensus.

- **Passion for Technology** – This skill area has an interesting "twist." Product Managers are expected to fully understand the technology involved in a product or service offering but not necessarily invent it. They must be able to explain technology to non-technical team members and ultimately customers. They must also be proficient enough to earn the respect of the technology developers/inventors, who are often gifted individual contributor engineers. Good Product Managers have a wide-ranging curiosity about technology and can create "buzz" within the organization for relevant technology.

- **Communicates Clearly** – The primary responsibility of Product Managers is communication. They must be able to distill complex technologies into more easily understood concepts. Product Managers are the internal corporate spokesperson/cheerleader for technology and must "sell" ideas to attract resources. This requires excellent skills in written, oral and visual communication, which is often a struggle for new-to-the-job Product Managers.

- **Inspires Collaboration and Teamwork** – Innovation is a "team sport" in that virtually all new products are developed and launched with a team of multi-functional employees. Product Managers sit at the "hub of the wheel" and requires excellent team building and collaboration skills. In many companies, Product

Managers are charged with the sharing of "best practices" across the organization, which requires inter-team collaboration skills.

- **Leadership** – This is a difficult skill area. Product Managers are frequently in the situation of leading (or influencing) multi-functional resources, where this is great responsibility to deliver results yet not direct authority over these resources. This is often called "leading by influence" and it requires special skills and experience. Leadership also means setting a vision for "what's possible," while developing the human capital to achieve this vision. Some Product Managers have direct reports; some do not -- yet they are charged with growing the skills of team members.

- **Excellent Project Management Skills** – This is the actual, daily work of Product Managers. On a fundamental level, this means temporal and sequential thinking skills displayed through team management. It has also come to take on the responsibility for setting priorities, deciding on what is most important at any given point in the process. In some organizations, Project Management also means quality of executing the innovation process, which is charged to the Product Manager.

Study Limitations and Discussion

Three limitations need to be acknowledged regarding the present study. First, although in-depth interviews offer a source of rich stories, self-reporting by each participant does not guarantee a comprehensive or accurate description of the skills required by Product Managers. This is a recognized constraint of interview methodology.

The second limitation addresses the extent to which the findings can be generalized to a larger population. The research insights and skill set presented here should have relevance for many Product Manager roles; however, these insights may not hold true to all types of Product Management work. Importantly, there was not unanimous agreement by interviewees on the wording of the skill areas or rank order.

The final limitation is the statistical integrity of the post-interview survey, given the small sample size. 13 of a total 17 interviewees responded to the survey and this small sample size produces standard error ranges, which reduces confidence levels. A next step might be to field a similar survey instrument to a broader range of companies.

Notwithstanding these limitations, this research may provide value. It could provide a guide for developing future Product Managers within the ME310 course structure. It's clear that business understanding, customer need finding and communication skills are important to the success of Product Managers and would benefit through advanced instruction in these areas. The same may be true for the skills of Inspiring Collaboration and Teamwork, although with a lesser sense of urgency given their lower rank priority.

The timing of this advanced instruction is also important. Some students will benefit from this learning immediately as they enter organizations on the "product management" track. Other students may return to Stanford, after several years of experience in industry, to learn product management skills.

Acknowledgements

The author would like to thank Professor Larry Leifer at Stanford University for his thoughtful comments, Bev Principal at Stanford's Career Development Center and all 17 interviewees who generously donated their time to this effort.

Bibliography –

1. Committee to Assess the Capacity of the U.S. Engineering Research Enterprise, National Academy of Engineering. Engineering Research and America's Future: Meeting the Challenges of a Global Economy [Internet]. The National Academies Press; 2005. [cited 2009 May 13] Available from: http://www.nap.edu/catalog.php?record_id=11393

2. Mark Schar. Focus or Die: OGSP: Innovation as Strategy [Internet]. Innovation as Strategy. [cited 2009 May 13] Available from: http://ogsp.typepad.com/focus_or_die_ogsp/2008/08/innovation-as-s.html

3. Patenting by Organizations, 2008 [Internet]. [cited 2009 May 13] Available from: http://www.uspto.gov/go/taf/topo_08.htm#PartB

4. Malone MS. Bill & Dave: How Hewlett and Packard Built the World's Greatest Company. Portfolio Hardcover; 2007.

5. About Us: HP corporate objectives and shared values [Internet]. [cited 2009 May 11] Available from: http://www.hp.com/hpinfo/abouthp/corpobj.html

6. Rock Star Engineers Debut in Intel's New Advertising Campaign That Focuses on the Future [Internet]. [cited 2009 May 11] Available from: http://www.fastcompany.com/blog/clay-dillow/culture-buffet/intel-shifts-focus-future-new-advertising-strategy

7. Garner GO. Careers in engineering. Dubuque, Iowa; London: McGraw-Hill Contemporary Learning ; McGraw-Hill [distributor]; 2008.

8. McDavid RA, Echaore-McDavid S. Career opportunities in engineering. New York, NY: Ferguson; 2007.

9. Online Survey Software Tool - Create Online Surveys - Zoomerang [Internet]. [cited 2009 May 11] Available from: http://zoomerang.com/

Interviews: (Recorded)

Ken Norton,
Google, Product Manager (March 19, 2009)

Gordon Brunner,
The Procter & Gamble Company, Retired Chief Technology Officer (March 31, 2009)

Rich Foss,
Motorola, Senior Vice President Product Management (March 31, 2009)

Kerry Olin,
Microsoft, General Manager College Recruiting (March 30, 2009)

Atticus Tysen and **Greg Wright**
Intuit, General Manager Quickbooks and Product Manager Quickbooks (April 6, 2009)

Ken Hake
Hewlett-Packard, Recruiting Manager

Vance Prather
Logitech, Senior Manager, Program Management (April 6, 2009)

Jay Tedeschi
Autodesk, Product Solution Evangelist, CAD/CAE Manufacturing Industry Group (April 10, 2009)

Jan Becker,
Bosch, Foresight Engineer and ME 310 Liaison (April 13, 2009)

Katherine Moore-Lilly
The Procter & Gamble Company, Senior Product Manager, (April 14, 2009)

Scott Lawley
SAP, Global Ecosystem and Partner Group (April 15, 2009)

Rich Holloway
CNH, Platform Manager AG Products and Innovation (April 16, 2009)

Al Butkus
Grumman/Butkus, Founder - President (April 22, 2009)

Jonathan Lee
Volkswagen of America, Senior Engineer, Electronics Research Laboratory (April 22, 2009)

Umesh Rustogi
SAP, Solutions Manager (April 27, 2009)

Lisa Trusty
Nokia, University Relations & HR Communications (April 28, 2009)