Three Footnotes to “Heavyweight Product Manager”

Kenichi KUWASHIMA a)

Abstract: This paper suggests three footnotes regarding heavyweight product manager (HWPM). HWPM, a term coined by Fujimoto (1989), refers to powerful managers that act as both internal and external integrators.

Footnote 1: Fujimoto (1989) used the term “product manager” for project managers responsible for product development to emphasize their long-term and wide range of responsibilities and authority, which continue even after the completion of a product development project.

Footnote 2: The list of internal integration index and external integration index used to measure HWPM and the organizational variables that comprise the two are given in the Appendix of Clark and Fujimoto (1991). However, the organizational variables noted as composition factors for these indices are misprints. In fact, it is necessary to reverse the organizational variables that refer to the indices.

Footnote 3: Based on their empirical study, Clark and Fujimoto (1991) classify the following two cases as “lightweight product manager structures.” First is one in which “the degree of internal integration is high while that of external integration is low,” and second is when “the degree of internal integration is low while that of external integration is high.” However, the two product

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a) Graduate School of Economics, University of Tokyo, kuwa@e.u-tokyo.ac.jp
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Kuwashima

development organizations significantly differ. By classifying them, it is possible to glean deep insights into the relationship between the product development organization and product development performance.

Keywords: product development, organization, performance

Introduction

Studies on innovation management (e.g., Thomke, 2007; Ulrich & Eppinger, 2008; Wheelwright & Clark, 1992) classify product development organizations into four categories.

(a) Functional organizations
(b) Lightweight project manager organizations
(c) Heavyweight project manager organizations
(d) Project organizations

However, as shown in Table 1, each type of organization is referred to by slightly different names in various texts.

In the classifications (Table 1), the spectrum of organizations bounded by the (a) traditional functional organization and (d) project organization contain (b) lightweight project manager organizations and (c) heavyweight project manager organizations.\(^1\)

In mentioning the four types, academic papers and texts generally quote Clark and Fujimoto (1991) and Wheelwright and Clark (1992) (e.g., Afuah, 2003; Brown & Eisenhardt, 1997; Nobeoka & Cusumano, 1997; Tidd, Bessant, & Pavitt, 2001).

However, the terms “heavyweight” and “lightweight” were coined by

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\(^1\) In general, organizational theory terms (b) lightweight project manager organizations and (c) heavyweight project manager organizations as types of matrix organizations.
Three footnotes to “heavyweight product manager”

Table 1. Four types of product development organizations

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<tbody>
<tr>
<td>(a) functional organization</td>
<td>functional groups</td>
<td>functional organization</td>
<td>functional team structure</td>
<td>functional structure</td>
</tr>
<tr>
<td>(b) lightweight project manager organization</td>
<td>lightweight project manager</td>
<td>lightweight project matrix organization</td>
<td>lightweight team structure</td>
<td>lightweight product manager structure</td>
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<tr>
<td>(c) heavyweight project manager organization</td>
<td>heavyweight project leader and team</td>
<td>heavyweight project matrix organization</td>
<td>heavyweight team structure</td>
<td>heavyweight product manager structure</td>
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<tr>
<td>(d) project organization</td>
<td>autonomous project team</td>
<td>project organization</td>
<td>autonomous team structure</td>
<td>project execution team structure</td>
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Figure 1. Function-project spectrum and organization type

Professor Takahiro Fujimoto, and the four organization types were first mentioned in his doctoral dissertation, “Organizations for Effective Product Development” (Fujimoto, 1989).

In the present paper, we suggest three footnotes regarding HWPM

2 From an e-mail response by Professor Takahiro Fujimoto in December 2012.
3 This can be confirmed by the description of Wheelwright and Clark (1992, p. 343) that “these forms of organization were first developed in Fujimoto’s “Organizations for Effective Product Development.”
while referring to the foundational work of Fujimoto (1989) and Clark and Fujimoto (1991), which are currently used by standard texts on innovation management.

**Footnote 1: Why “Product” Manager?**

According to Fujimoto (1989) and Clark and Fujimoto (1991), HWPMs are powerful managers that function as both internal and external integrators. Internal integration refers to “inter-departmental coordination function” in product development projects. On the other hand, external integration refers to the “concept champion function,” namely the creation of product concepts corresponding to customer needs, with those needs being reflected in the actual products. In other words, HWPMs have a broad range of inter-departmental coordination responsibilities, including production and sales, in addition to product development, and at the same time they are responsible for product concept creation.

Regarding product development projects, HWPMs have greater authority than functional managers and function as general managers. The expression “the words of heavyweight product manager is the same as that of president” reflects this strength.

Why do Fujimoto (1989) and Clark and Fujimoto (1991) refer to product development project managers in this type of role as heavyweight “product” managers?

Project managers are typically those individuals responsible for product development projects. His or her responsibility ends with a new product launch or on completion of the product development project. By contrast, “product managers” are responsible for production and sales even after completion of the product development project. An example from the automotive industry is the manager responsible for not only products currently being sold but also minor and major model updates and follow-ups. In other words,
“product managers” have a broader range of responsibilities and authority than “project managers” in terms of time span.

In general, the excellent project managers of product development, or HWPMs, discussed in the automotive industry studies by Fujimoto (1989) and Clark and Fujimoto (1991), were managers with extraordinarily powerful authority and a broad range of responsibilities. This broad range of responsibilities and authority is also applicable from the perspective of “time.” The term “product manager” was chosen to show the characteristics of these types of managers rather than “project manager.”

Footnote 2: Misprints on Measurement Index of HWPM

The empirical study by Clark and Fujimoto (1991) uses an organizational index comprising 29 organizational variables to measure and classify organization types of the sample companies. Table 3 of their book shows all organizational variables (List of Organizational Variables, p. 382), and Table 4 shows an explanation of the organizational index (Organization and Process Index, p. 383).

However, the explanation of the internal integration and external integration indices (which contains misprints) is most important in measuring HWPM organizations, included in Table 4.

Explanations for both indices in Table 4 are as follows.

Internal Integration Index: A subindex of the overall integration index (variables 8–14 and 17 in Table 3) that measures pattern consistency in terms of strong power/influence and wide responsibilities of internal integrators, particularly those of a

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4 From an e-mail response from Professor Takahiro Fujimoto in December 2012.
5 However, although texts quote Clark and Fujimoto (1991), many use the term “heavyweight ‘project’ manager” rather than “heavyweight ‘product’ manager,” as shown in Table 1 of the present paper.
product manager who is also a full-time project coordinator.

External Integration Index: A subindex of the overall integration index (variables 1, 2, 7, 15–20, and 26 in Table 3) that measures pattern consistency in terms of strong power/influence and wide responsibility of external integrators, typically those of product concept creators.

Within these explanations, the numbers quoted in parentheses refer to organizational variable numbers from Table 3 in the Appendix in Clark and Fujimoto (1991). Excerpts of the 17 organizational variables used for these indices are given below.6

1. Product managers exist
2. Product managers are responsible for wide development stages/areas
7. Product managers maintain direct market contact
8. Concept creators have a strong influence over marketing decisions
9. Concepts are created through cross-functional discussion under the leadership of concept creators
10. Concept generation and product planning stages are merged
11. Concept creators perform product planning
12. Concept creators perform layout
13. Simultaneous development of concept and styling
14. Simultaneous development of layout, styling, and engine choice
15. Product managers perform product planning
16. Product managers are responsible for layout
17. Product managers perform concept generation

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6 The numbers at the front of each point are the numbers for the organizational variables listed in Table 3 in the Appendix in Clark and Fujimoto (1991).
18. Product managers have significant influence (formally and informally) over product engineering
19. Product managers maintain direct contact with working engineers
20. Liaison persons have strong influence over working engineers
26. Product managers have strong influence outside the engineering function

As is clear in considering the organizational index explanation above and the content of the organizational variables, the underlined portions of the organizational variables quoted in the external integration and internal integration indices are misprints, and the contents of each should be “switched.” They must be edited as follows to correctly measure both indices. Namely, the organizational variables applicable to the internal integration index are 1, 2, 7, 15-20, and 26, while those applicable to the external integration index are 8-14 and 17.\footnote{Iansiti (1998) is an empirical study that uses the organizational index in Clark and Fujimoto (1991). This research correctly understands the content of the organizational variables (i.e., it switches organizational variables for internal and external integration indices per this paper) in its analysis.}

Footnote 3: Potency of HWPM Organization Framework

As noted above, according to Clark and Fujimoto (1991), an HWPM is a powerful manager that functions as both an internal and external integrator. Based on this definition, product development organizations can be classified into four types as shown in Figure 2 (the matrix in Figure 2 is called the HWPM Organization Framework herein).

The relationship between the four organization types within the HWPM Organization Framework (Figure 2) and those (a–d) listed in
the innovation management texts mentioned at the beginning of this paper is as follows.

An HWPM organization (c) is a case where both internal and external integration are high. In extreme cases (i.e., cases where both internal and external integration are extremely high), these are known as project organizations (d). On the other hand, functional organizations (a) have low internal and external integration. The remaining two types, where either internal integration or external integration is high (X and Y), are classified as lightweight product manager organizations (b).

Thus, in classifications based on the HWPM definition by Clark and Fujimoto (1991), we see two types of lightweight product manager structures, X and Y. However, Clark and Fujimoto did not
attempt analyses that distinguished the two.

The section on Organization and Performance in Chapter 9 in Clark and Fujimoto (1991) uses the internal integration and external integration indices (in other words, distinguishing internal from external integration). They use the indices to analyze the relationship with development performance. However, in a later analysis of organization types and development performance, there is no distinction of internal and external integration, and an overall integration index is used to summarize both.

This index shows the so-called “degree of HWPM.” A high level can be seen as an HWPM organization, while a low level as a functional organization. As a result of an analysis on the relationship between the “degree of HWPM” and development performance (productivity, lead-time, and total product quality), Clark and Fujimoto (1991) showed that an HWPM organization contributes to product development performance.

However, after summarizing the internal integration and external integration indices, measuring the degree of HWPM leads to an inability to distinguish the two types of lightweight product manager organization in Figure 2 (X and Y).

If referencing actual product development organizations, organizational characteristics of X and Y significantly vary. For example, in product development in which the necessity of concept creation (i.e., external integration) is low and that of intra-organizational coordination (i.e., internal integration) is high, as with certain high-tech computer components, an organization of

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9 More accurately, the overall integration index comprises the internal and external indices, as well as two additional indices, the “integrated engineering index” and “other integration mechanisms index.” The 29 organizational variables are used in measuring these indices.
type X may be effective. On the other hand, in product development, where the necessity of external integration is high while that of internal integration is not very high, such as with beer, an organization of type Y may be effective.

Following Clark and Fujimoto (1991), much research has been done on the relationship between product development organizations and development performance to answer the question of whether the HWPM organization was effective outside of the automotive industry. (e.g., Eisenhardt & Tabrizi, 1995; Iansiti, 1998; Kuwashima, Takahashi, & Tamada, 2005; Pisano, 1997; Sato & Fujimoto, 2013; Tomita, 2009; Wi, 2008; Yasumoto & Shiu, 2007; Yoshimoto, 2009). However, few research considers differences in organization types (X and Y).

It has been 20 years since Fujimoto (1989) and Clark and Fujimoto (1991) introduced the concept of HWPM organization. By reclassifying product development organizations using the HWPM organization framework based on their definitions, it becomes possible to grasp a more detailed insight into the relationship between product development organizations and product development performance.

References


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10 See Kuwashima (2013a) for more details.
11 One exception is Fujimoto and Yasumoto (2000).


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