The preliminary results from the software product management state-of-practice survey

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Abstract. Software product management (SPM) as a discipline includes many practices like product and release planning, market analysis, roadmapping, and product lifecycle management. Product management frameworks prescribe these practices but companies seldom adopt all of them. We conducted a state-of-practice survey with the aim to investigate how companies adopt SPM practices and how this practical experience fits together with the framework suggested by International Software Product Management Association (ISPMA). The results of this study showed that ISPMA SPM Framework describes core product management practices well but the impact of product management practices to the final product success remains ambiguous.

Key words: software product management, state of practice, survey

1 Introduction

Software product management (SPM) unites business and technical perspectives in the development of software products. SPM defined as *business management at the product, product line, or product portfolio level* [1] in a software organization [2] represents a model for strategizing, conceiving, developing, introducing, managing, and marketing new products to the market.

There are several frameworks developed to address the specific features of managing software products [2, 3, 4, 5]. They describe the structure and content of software product management as lists of practices that should be adopted by companies. These lists include from 16 to 38 practices. Companies rarely adopt all product management practices and focus on subsets of them that bring most benefits to the business [6]. In contrast, the existing frameworks provide little guidance on how to adopt them iteratively rather than instantly [6]. Understanding and inclusion of these priorities observed in practice to frameworks would be an important step for further development of SPM education, research, and practice. The ISPMA SPM Framework v.1.1 [2] was chosen as a reference model for this study because it represents a consensus between industry and research that integrates previously known reference models.

2 Background

There have been some attempts to highlight the most important practices in product management for achieving product success. For example, Kittlaus and Clough divide SPM practices into core and supporting practices at product and corporate levels [3]. Core practices are major functions in which a software product manager is involved while supporting practices are orchestrated by product managers but not directly managed. Using the same definition of core and supporting SPM practices, Maglyas et al. identified six core practices and concluded that it is reasonable to expect an expertise in these practices from every product managers while other skills may depend on the domain and type of product [7].

The results of these empirical works are not conclusive, however. Core product management practices and responsibilities of product managers vary from one study to another depending on the framework with which the assessment is done. Such heterogeneity is not a new problem, though, and has been addressed with industry standards that offer consolidation.

In order to consolidate the existing knowledge and experience in the field of software product management, the International Software Product Management Association (ISPMA) created its SPM framework [2, 8].

3 Research methodology

This study investigated product management practices with the ISPMA reference model. It aimed at understanding how SPM practices described by ISPMA fit together with SPM practices used in real life and thereby give decision-support for the adoption of SPM practices. Two research questions were defined as follows:

- RQ1: *Does the ISPMA framework reflect software product management practice?*
- RQ2: *Does practice differ between junior and senior product managers?*

A survey followed by a focus group discussion with software product management experts was selected as the main research tool.

ISPMA SPM framework v.1.1 consists of 38 practices involved into development and release of a product to the market. These practices were grouped into several questions according to the framework structure. Each question was related to one column of the framework and was formulated as follows:

Which of the following practices are/were performed with you feeling responsible for?

The first option for answers was exclusive (*not leading any XXX practice*, where XXX is the name for a group of practices in the framework). The survey was conducted using a web-service called FluidSurveys[1]. Invitations to participate in the survey were distributed using the snowballing technique [9].

[1] http://fluidsurveys.com

The survey was conducted for a period of six months started in October, 2012 and finished in March, 2013. Then, the gathered results were discussed with experienced product management professionals from industry and academia at the ISPMA member assembly meeting in April 7, 2013. In this meeting, additional input on how the results fit with practice was collected in the form of meeting notes.

4 Results

The survey was answered by 100 respondents. 48 responses were incomplete, five responses were test fillings, and one response was excluded from the analysis as an outlier due to its ridiculous answers. The demographic information about the respondents and companies they work for is presented in Figure 1.

Company			Product			Development		
Size (number of employees)			**Industry (application domain)**			**Time-to-market**		
<10	3	7%	Software / IT	11	24%	Less than 4.5 months	10	22%
10-49	15	33%	Medical / Health Care	7	15%	4.5 months to < 9 months	18	39%
50-249	11	24%	Banking / Finance	5	11%	9 months to < 18 months	14	30%
250-4499	12	26%	Manufacturing	3	7%	More than 18 months	3	7%
>=4500	5	11%	Media / Publishing	3	7%	I do not know and cannot estimate	1	2%
Age (years)			Government / Military	2	4%	**Release heart-beat**		
<3	13	28%	Private / Consumer	2	4%	More than 12 releases per year	3	7%
3-7	11	24%	Retail / Wholesale	2	4%	5-12 releases per year	5	11%
8-15	9	20%	Telecommunications	2	4%	3-4 releases per year	8	17%
16-39	7	15%	Construction / Contracting	1	2%	About 2 releases per year	17	37%
>=40	6	13%	Insurance	1	2%	About 1 release per year	7	15%
Location			Nonprofit Institutions	1	2%	Less than one release per year	5	11%
Netherlands	14	30%	Other	6	13%	No release so far	1	2%
Sweden	8	17%	**Product team size**					
USA	7	15%	<4	5	11%			
Finland	5	11%	4-9	14	30%			
Switzerland	5	11%	10-19	9	20%			
Russia	4	9%	20-49	9	20%			
Czech Republic	1	2%	50-249	7	15%			
Germany	1	2%	>250	2	4%			
Denmark	1	2%						

Fig. 1. Demographics of the collected data

In the survey, we asked respondents to mark product management practices that they are responsible for. In general, SPM follows some key practices but there is variation between other practices. In more than 75% of the cases, product managers were responsible for five SPM practices: positioning and product definition, business case and costing, roadmapping, release planning, product requirements engineering. In this regard, these practices represent core product management practices observed in practice. In addition, all these practices are included to the SPM framework as core practices as well.

Another set of five SPM practices (innovation management, product analysis, product lifecycle management, project requirements engineering, product launches) was observed as related to product management by more than 50% but less than 75% of the respondents. Two of these practices (product analysis and product lifecycle management) considered as core SPM practices by ISPMA

framework but in practice only some product managers take responsibilities of these practices.

In our analysis we also compared how the work of SPMs differs from the work of senior SPMs. The sample included 23 product managers and 11 senior/head product managers. The results of two-tailed difference of proportion test are presented in Figure 2. We used Holms step-down method [10] for limiting the alpha error that accumulates over the repeated application of individual statistical tests. Here an alpha error is an apparent difference, which in reality is not a difference but just represents the luck of the investigators. This approach ensures that the total error is below the initially predetermined threshold.

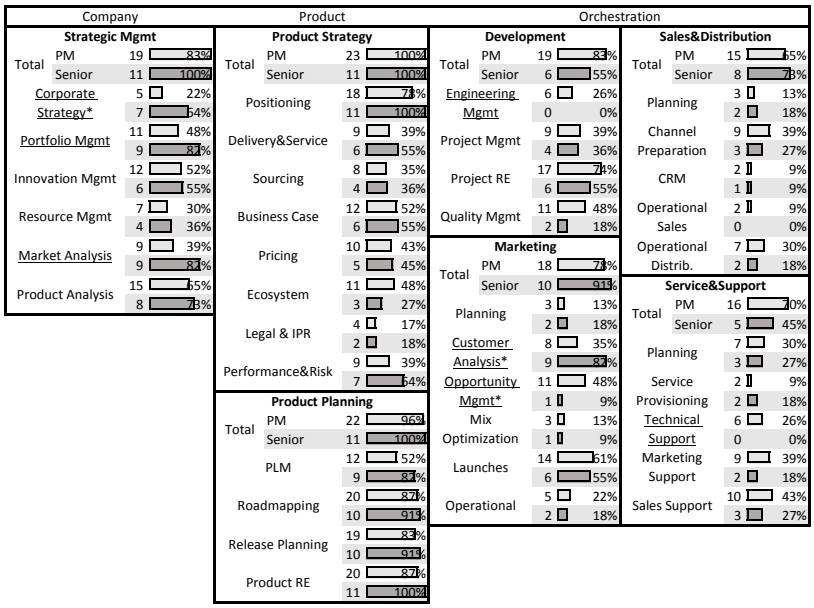

Fig. 2. Differences between software product managers and senior software product managers (two-tailed difference of proportions test, p<0.05*, p<0.1)

Our results revealed that non-senior SPMs tend to interface more with development and operations than senior SPMs. Senior SPMs tend to be involved in corporate strategy more than SPMs. In particular, the senior SPMs have more often an active role in the definition of corporate strategy and portfolio management. To support these decisions, they are more frequently involved in market and customer analysis than SPMs. Regardless of their seniority, product managers are heavily involved into product strategy and product planning while their involvement in marketing, sales & distribution, and service & support is limited. Only a few product managers marked these practices as being under their control.

5 Discussion

Maglyas et al. investigated core product management practices in another survey conducted worldwide and concluded that core product management practices are product analysis, roadmapping, strategic management, vision, product lifecycle management, and internal and external collaboration [7]. Product analysis, roadmapping, and product lifecycle management practices were identified as core practices in this survey as well. Strategic management is included in the ISPMA framework as a set of practices consisting of other practices and therefore cannot be directly compared. The core practice vision is included into the ISPMA framework as business case and costing. The results showed that 78% of respondents were responsible for this core practices and therefore the results fit well with the ISPMA framework and Maglyas core SPM practices. Internal and external collaboration is not included as a separate practice in the SPM framework but it is embedded to the framework structure through practices in which a product manager participates or orchestrates.

Overall, the ISPMA framework structure has several misalignments with practical experience of product managers in the software industry. Some core practices like pricing, legal and IPR management that were not often implemented by product managers as their main responsibilities represent variations in the adoption of SPM. A framework like the ISPMA SPM framework should make such differences between recommendation and practice explicit by providing rationales for the recommended infrequent practices and suggesting criteria regarding their adoption.

The analysis of responsibilities of senior software product managers and software product managers revealed that senior product managers tend to be responsible for the practices related to strategic management like corporate strategy, portfolio management, and market analysis while non-senior product managers tend to be responsible for orchestration functions like engineering management, opportunity management, and technical support.

As a unified group product managers can be seen middle managers who act as linking pins connecting the top management with the lower-level managers [11]. As an individual in this mediating position between strategic and operational levels, the product manager tends to move to senior product management position.

The main limitation of this study was the size of sample that was a result of low response rate. Increasing the sample size would help to get more statistically significant results. However, these preliminary results provide us with some insights on how product management practices are adopted in organizations and therefore can be used for generating hypotheses for new surveys with more focused questions on particular SPM practices.

The use of snowballing with a particular focus on the ISPMA network led to a non-random sample but we accepted the non-random sampling as a trade-off.

6 Conclusions

The survey results provide a general overview of how SPM is adopted in practice and how the adoption of SPM fits together with the theoretical ISPMA SPM framework that represents a consensus between industry and academia. However, due to the limited number of responses, we could not identify success-correlating practices.

The empirical validation of core product management practices described in the ISPMA SPM Framework showed that product managers are responsible for most of the suggested practices in their daily work. Leaving out the variations between different companies, the SPM Framework provides a good reference point to what product managers should be responsible for. These results are also aligned with previously identified six core product management practices [7].

Overall, the survey gives us insights to the state-of-practice in the field of software product management and contributes to the product management body of knowledge. The presented results are a basis to adapt the theoretical frameworks to real-world practice.

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