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Enhancing Startup Success Rates: Towards a Pragmatic Framework for Product Managers (PFPM)

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Abstract— This study addresses the underrepresentation of the Product Manager (PM) role in determining the success of startups, particularly in the Requirements Engineering (RE) domain. Despite the high failure rate (63%) among software industry startups, the PM role is often completely unknown to founders, and academic research on this issue is lacking. Through a preliminary literature study, 662 unique tasks, condensed to 122 activities, were identified, associated with the PM role, with cash flow management was only mentioned once in the literature, despite being a critical reason (82%) for startup failures. Only a small percentage (11%) of the papers focused specifically on the startup context. To address these issues, our aim is to develop a novel, startup-specific framework that reduces the number of PM tasks to those that are valuable in its context and suggests improvements for each task accordingly. This framework could enhance early-stage product decision-making for founders, including cash flow management related tasks, and increase their probability of success. Not only contribution have practical implications for startups, but it could also stimulate further collaborative academic research in the field of RE.

Keywords— *Startups, Product Manager, PM, Requirements Engineering, RE, New Product Development, NPD, Software Product Management, SPM, Cash flow*

I. INTRODUCTION

Software startups often operate in a high-paced, uncertain, and resource-constrained context [1], which can result in premature scaling and an increased risk of business failure due to cash flow challenges [2]. Founders are often overly confident in their chances of survival [3], leading them to dive into early product decision-making tasks without knowing which ones will generate value for their early-stage venture. As a result many startups lack a strategic plan for product development [4], conduct inefficient select requirements [12], struggle with critical resource allocation [13], conduct insufficient market research or business case analysis [2], and allocate resources to solutions that do not address any market needs [5]. These issues can hinder achieving product-market fit [6], and acquiring the first paying customers [1], negatively impacting the startup's runway and likelihood of success. Therefore, improving the early product [7] decision-making processes can have significant implications [8] for the future performance [9, 10], and probability of success of these ventures.

Over the past four decades, the role of the Product Manager (PM) has emerged as a crucial factor in Requirements Engineering (RE), New Product Development (NPD), and Software Product Management (SPM). Proper product management processes have shown to improve resource management efficiency (18%) [11], lead to increased business growth [12], better budget control [13, 14], higher user satisfaction [12, 15], increased release predictability [16] and faster release cycles [14, 16, 17]. All of these factors are positively associated with startup success [18]. However, this knowledge and practice are not widely known in entrepreneurial ventures [19], despite efforts by organizations such as the International Product Management Association (ISPMA). This sentiment is echoed by Frank Maene, Managing Partner at Volta Ventures, and an early stage software-focused venture capital company, who states that:

“Startup founders have no clue what product management is, practically all do it wrong.”

Despite the importance of the PM role, a universally accepted definition is still lacking. The general consensus is that there needs to be an owner of the product [4] responsible for the product strategy, execution, and follow-up [18]. Informally, this role is often referred to as a PM. However, beyond these common responsibilities, a total of 662 unique tasks associated with the PM role have been identified in the ongoing Study-1 (see section II.C). In an effort to address this gap, the ISPMA has developed their Framework for Product Management [20]. However, this framework is relatively broad and doesn't specifically consider the unique nature and challenges of a startup context, nor is it based on rigorous academic research.

By addressing the following main and sub research questions, it becomes possible to improve the existing framework and lay the groundwork for defining a novel, startup-specific framework called the “Pragmatic Framework for Product Managers” (PFPM):

Main: What are the most valuable tasks that a Product Manager (PM) should undertake within the context of a startup?

Sub: Is the current state-of-the-practice for these tasks appropriate in the context of startup, or do they require re-evaluated and improvement?

The PFPM should be of significant value to anyone holding a PM role, especially in startups [20]. Additionally, the results of this study can contribute to future research in RE. Ultimately, the aim is to indirectly enhance the survival prospects of startups and potentially improve their valuation outcomes [21] by minimizing costly early decisions through the implementation of product management practices that align with the specific startup context.

Section II.A summarizes the current status of the research, and section III providing the expected contributions and summary.

II. CURRENT STATUS OF THE RESEARCH

A. Research design

Figure 1 shows the research design towards the creation and validation of the novel PFPM (see section D), and further refined considering a software startup context (see section E).



Fig. 1. Research design

B. Status of the different studies

At this juncture, the research endeavors are in the preliminary stages, and are not published yet (Table 1).

TABLE I. STATUS OF THE STUDIES

Study	Focus	Status	Ready for submission
Study-1	Conduct a Systematic Literature Review (SLR) to identify the tasks related to the PM role.	In progress	09/2023
Study-2	The creation and validation of the basic Pragmatic Framework for Product Managers (PFPM) through an academic expert judgement survey.	In progress	12/2023
Study-3	Product Manager expert assessment survey to further refine the PFPM toward a software startup context.	In progress	06/2024
Study-4	Conduct a longitudinal case study to investigate the relationship between PM experience of founders and startup firm performance.	In progress	07/2025

Nevertheless, considerable progress has been made in developing a comprehensive knowledge base and fostering a community of scholars and practitioners who share similar interests. These efforts are crucial as they lay the foundation for future research outcomes, provide a framework for evaluating research outcomes, and facilitate the dissemination of knowledge. It is important to note that the early stages of research play a vital role in setting the tone for subsequent phases and have a significant impact on the trajectory of the study. Thus, the current status of this research underscores the importance of investing in the foundational stages to ensure the success of the overall study.

C. Study-1: Systematic Literature Review (SLR)

Study-1 is a Systematic Literature Review (SLR). A non-published supporting technical report [22] has been authored to document the methodology used for the SLR in detail. This study has been made available through ResearchGate and includes, among other things, the different steps of the used Review Protocol, the description of the search strategies, the inclusion and exclusion criteria, and the results of a pilot run of the Review Protocol on 100 papers.

What sets this SLR study apart from others in its domain is its research goals. Specifically, Hujainah, Bakar [9], Ma [23], emphasize the selection variables and methods employed within Requirements Engineering (RE) while neglecting the domains of interest, namely the role of the PM and the startup context. On the other hand, Gupta, Fernandez-Crehuet [24] demonstrates a strong focus on the startup context, but it remains descriptive and does not provide a link to the perspective of practitioners.

The first research strategy employed in this study involved searching for papers using specific terms (strings). Table 2 provides an overview of the RE terms obtained and used through this strategy. This is only a subset of the used terms in the SLR.

TABLE II. REQUIREMENTS ENGINEERING RELATED DOMAIN STRINGS

Requirements Engineering related Domain strings
Product management
Value-based software engineering
Requirements prioritization
Requirements elicitation
Stakeholder value propositions
Feature selection
Requirements engineering
Requirements management
Evidence-based software engineering
Goal-oriented requirements engineering
Requirements selection
Requirements triage

The second search strategy aims to expand the master file with citations from the top five papers, including the best systematic literature review. Three of these specifically fall within the domain of Requirements Engineering (RE) [9, 16, 17, 25, 26].

Currently both search strategies have been completed, resulting in a master file 1.087 papers (Table 3). Out of these, 134 were approved for further analysis. 105 were a result of

research strategy 1 (Fig. 2) and 29 of research strategy 2 (Fig. 3).

TABLE III. MASTER FILE FOR SLR

Strategy	Total papers in master file	Selected papers
Search strategy 1	645 papers	105
Search strategy 2	442 papers	29
	<i>1.087 papers</i>	<i>134</i>

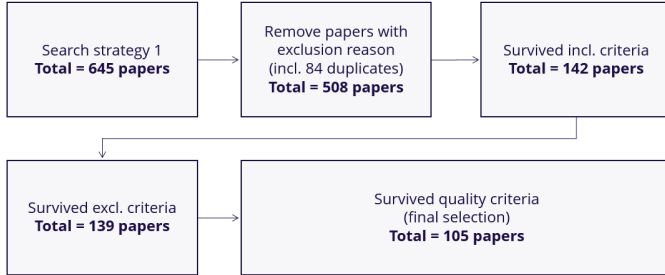


Fig. 2. Search Strategy 1 – Results

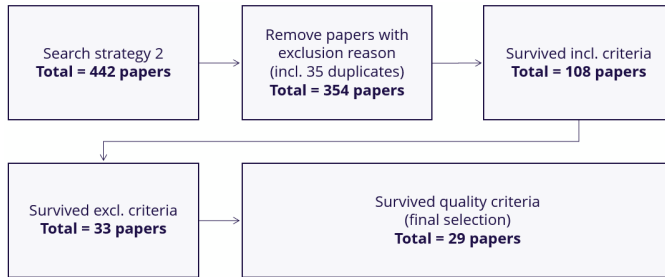


Fig. 3. Search Strategy 2 - Results

The selection of papers was conducted by applying the inclusion criteria (Table 4) and exclusion criteria (Table 5) as specified in the research protocol. Following the approach of Hujainah, Bakar [9], only papers with an inclusion score of at least 50% (or a score of 1.5 out of 3) were included. Regarding the inclusion criteria, each paper was thoroughly examined to determine if there were explicit references to the role of the Product Manager (PM). The body of every paper was searched for the term "Product Manager" to identify any mentions or discussions related to this role. Additionally, the inclusion criteria considered whether the studies assigned any tasks directly to the PM role. As for the exclusion criteria, if the sum of the criteria was less than two, the paper was excluded from further analysis.

TABLE IV. INCLUSION CRITERIA OF STUDY-1

	Inclusion criteria	1	0.5	0
1	Reporting on expected value.	Explicitly	Superficially	Not mentioned
2	Reports on the domain tasks (processes).	In-depth	Superficially	Not mentioned
3	Addressing involved roles and titles within the domain.	PM explicitly mentioned	Involved roles are mentioned.	Not mentioned

TABLE V. EXCLUSION CRITERIA OF STUDY-1

	Exclusion criteria	1	0.5	0
1	Year of publication before 1/1/1983, the official birth of the Internet.	After 1983	N/A	Before 1983
2	There is no PDF file available	PDF available	N/A	No PDF found

The knowledge amassed in this study will be used as input for both Study-2 (see section E) and Study-3 (see section E).

D. Study-2: Academic Expert Judgement survey

The primary objective of this study is to create and validate the basic framework through academic validation. This involves refining the extensive list of 122 distinct PM activities identified in Study-1 (see section C) and assigning them to one of six domains. These domains have been adapted from the ISPMA ® SPM Framework V.2.0 [27] to ensure alignment with current industry best practices.

The survey conducted aims to match each of the 122 activities with one of the domains. When at least 90% of the experts agree on a specific pairing combination, it is considered validated. For pairings where consensus cannot be reached, a workshop will be planned to facilitate discussions and reach an agreement on the remaining pairings. To achieve the required level of academic scrutiny and depth, the survey will be presented to academics at least the level of a PhD student, ideally with expertise in Product Management, Business Informatics, Requirements Engineering, and related domains. Figure 4 shows what the basic version of the PPFM could potentially look like:

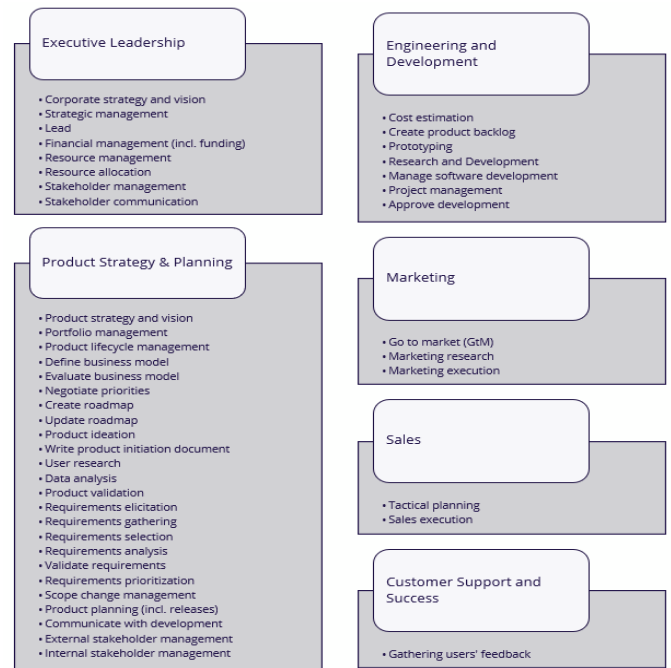


Fig. 4. Draft Pragmatic Framework for Product Managers (PPFM).

This study and Study-1 (see section C) could be combined in a single study.

E. Study-3: PM Expert Assessment survey

The primary objective of this study is to refine the PFPM (see section D) to be valuable for software startups, specifically focusing on highly-selective set of the most crucial ones for early-stage ventures. Consequently, the following research questions are predominant in this study:

- 1) *How can a Product Manager (PM) identify and perform the most valuable tasks within the context of a startup?*
and
- 2) *How can the current requirements prioritization methods be adapted to be more appropriate within a startup context?*
and
- 3) *Which requirements selection variables are the most appropriate to consider within a startup context?*

To accomplish these objectives, a survey instrument will be constructed, specifically tailored to the unique demands of a startup context. The target audience for this survey will consist of product management experts, in contrast to startup founders, applying expert assessment as the preferred methodology. This inquiry is anticipated to yield novel insights into the intricacies of startup product management and contribute to the identification of a select few context-appropriate key activities.

Consequently, this will aid in the development of an initial PFPM for entrepreneurial success, further enhancing the transparency and accessibility of the product management role for research and training purposes. The survey instrument will be subject to a trial run, in which academics specializing in RE and Product Management will be invited to participate. This will provide an opportunity for the academics to offer feedback on the proposed methodology, ultimately resulting in a robust methodology for the final survey instrument.

F. Study-4: Longitude case study

Study-4 aims to investigate how real-life software startup founders handle product management activities in the early stage of their ventures. This study compares firm performances among founders with varying levels of prior product management experience, ranging from none to expert, acquired either directly or through being a serial entrepreneur. In contrast to Study-3 (see section E), which utilized on expert assessment by PM professionals, Study-4 (see section F) focuses on analyzing the actual behavior of founders. This investigation is guided by two research questions:

- 1) *Does prior product management experience lead to better firm performance compared to those without experience?*
and
- 2) *Do founders who apply sound product management processes unknowingly have better firm performance compared to those who don't?*

To achieve these objectives, a partnership has been established with Start it @ KBC, the largest startup accelerator program in Belgium. Through this collaboration, 20 software

startups have been identified and are willing to participate in the study, which will commence in July 2022. The number of startups involved is notably substantial compared to other similar studies discussed by Pattyn [22], where five case studies were considered a valuable. The study approach starts (Figure 5) with a semi-structured interview primarily focused on their product management processes, including product strategy, idea validation, business case analysis, requirements selection, requirements prioritization, monitoring project results, and financial management, including cash flow and runway management.

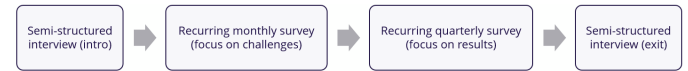


Fig. 5. Sequence of the study.

A monthly survey is administered, focusing on short-term product management challenges and victories. Response rates vary from month to month, and a steady decline is evident. Also, quarterly check-ins are conducted to track firm performance through key metrics that provide insights related to the impact and success of the startup. These metrics include: revenue, gross margin, active customers or users, number of employees, funding, and corporate objectives.

The study will conclude after one year of follow-up with a final semi-structured interview, capturing the same topics as the initial interview and capturing the final firm performance. This comparative analysis will enable researchers to examine the differences in early product decision-making processes and their corresponding impact on performance, influenced by the founders' level of product management knowledge. A follow-up study could be planned for another year (or two) with startups that are interested. These could be divided in two groups, one that's trained using the PFPM framework, and one that's not.

III. EXPECTED CONTRIBUTIONS AND SUMMARY

As the present study draws to a close, it has become evident that the intersection of the PM role and the unique context of startups remains an area with substantial scope for continued research. This underscores the significance of this research journey and reinforces its potential contribution. The ultimate goal of the ongoing research is to develop a Pragmatic Framework for (startup) Product Managers (PFPM), which consist of a concise and well-defined set of core tasks that will serve as the foundation for subsequent analyses in a software startup context. One of the envisioned tools within this framework is the Runway Prioritization Method, which incorporates cash flow management as one of the primary decision-making variables for startups. It is anticipated that this method will have a significant impact on reducing the failure rate of early-stage ventures.

The anticipated outcomes of this research would be valuable for both academia and industry, as it would provide actionable insights for founders and product managers to enhance their decision-making processes. This, in turn, has the potential to reduce the failure rate of software startups.

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