Towards a SaaS Pricing Cookbook: A Multi-vocal Literature Review

Andrey Saltan[1,2(✉)] and Kari Smolander[2]

[1] HSE University, Moscow, Russian Federation
asaltan@hse.ru
[2] LUT University, Lappeenranta, Finland
kari.smolander@lut.fi

Abstract. Informed SaaS pricing decision-making requires the involvement of different business units and integrated pricing approaches. Achieving both appears to be challenging for a lot of SaaS providers, and despite its declared importance, pricing is one of the most undermanaged business processes. Small and medium-sized companies do not have the resources for or the understanding of how to make informed decisions on pricing strategy and tactics. Pricing is a topic of interest in several research domains including economics, management science, digital and service marketing, and, increasingly, in software engineering. Still, the lack of integration between studies creates inconsistency in research. A comprehensive SaaS pricing body of knowledge is missing, as is a coherent action-oriented "Cookbook". This multi-vocal literature review both brings together results from these research domains and matches practitioner expertise with academic research outcomes to promote the advancement of SaaS pricing theory and practice.

Keywords: SaaS · Software-as-a-Service · Pricing · Multi-vocal literature review

1 Introduction

Pricing is recognized as one of the crucially important elements of business strategy and tactics in the majority of product and service companies [39]. Software companies, including SaaS providers, are not an exception. For them, pricing is crucial and requires sophisticated decision-making [13,38]. There is a keen interest in and need for better pricing methods and solutions in the software industry, which is experiencing a transition towards the service paradigm. Therefore, a growing number of practitioners and researchers are seeking pricing methods and solutions. However, the body of knowledge in pricing is vast and full of isolated pricing-related approaches and recommendations that can induce radically different pricing tactics and strategies.

By its nature, pricing lay on the intersection of different responsibilities, including Development, Sales, Marketing, Finance, Support, and informed

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decisions that require coherent effort coordination and collaboration between them [12]. The Software Product Management Body of Knowledge [27] specifies pricing as one of the core areas of responsibility of product managers. However, pricing requires sophisticated analyses based on internal and external information and product management requires extensive analytical support. Facing these challenges, large tech companies, including SaaS providers, employ highly qualified economists in cooperation with qualified product and project managers who are capable of coping with these pricing challenges [5]. However, SMEs do not have the resources and understanding to make informed decisions on pricing strategy and tactics. Inconsistent knowledge of SaaS pricing and the complications of proper implementation of all pricing-related processes and practices leads to a scattered and under-managed pricing process in many software and SaaS developing companies [12,52].

Incoherent pricing in the industry is mirrored in academic literature. There is no single "home" for studies on software and SaaS pricing in the academic community. Pricing is a growing field of research within several different research domains, including economics, management science, digital and service marketing, as well as software engineering and computer science. Still, the current theory does not offer coherent and verified solutions to assist product managers in selecting among the millions of options while designing and implementing pricing. Rare attempts to provide such guidance do not bring utilitarian value for practitioners [51].

The eventual goal of SaaS pricing research should be a body of knowledge that defines the scope and content of knowledge on SaaS pricing and a "Cookbook" that offers appropriate SaaS pricing designs to product managers based on parameters and objectives of a given situation. There should be no illusions that one SaaS pricing framework could be applicable to all types of products in all types of SaaS providers. Moreover, product managers and their teams remain responsible for deciding which SaaS pricing processes and practices should be applied to the specific product, taking into account product characteristics and overall business model and strategy. However, a "Cookbook" that consists of compartmentalized pricing frameworks, step-by-step solutions, and easy-to-use decision-support mechanisms could support product managers and in the long run improve pricing in SaaS industries.

As pricing is both a critical business function and a subject of academic research, we have searched for articles for this literature study from both pricing practitioners and leading scholars. Combining these two sources of literature in the systematic multi-vocal literature review allows us to explore existing pricing frameworks and systematize a diverse range of recommendations and guidance grounded either in research or practical experience. We explored available academic literature on SaaS pricing across various scientific databases and digital libraries ("white" literature, 76 items), as well as materials produced by practitioners and industry experts outside the traditional academic community ("grey" literature, 151 items). As a result, this research attempts to contribute to developing a concise and practical SaaS pricing "Cookbook" and comprehensive Body of Knowledge by comparing and analyzing thirteen existing SaaS pricing frameworks.

2 Background

2.1 SaaS Definition

The most common definition of SaaS is the one presented in 2011 by the United States National Institute of Standards and Technology (NIST) [35]. NIST defines the Cloud computing in general as: "*a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction*". Further, SaaS itself is defined as one of three service models cloud computing could be deployed along with Platform-, and Infrastructure-as-a-Service. Specifically, Software as a Service (SaaS) is "*the capability provided to the consumer is to use the provider's applications running on a cloud infrastructure*". The applications are accessible from various devices through a thin client interface or an application. The consumer does not manage or control the underlying cloud infrastructure, with the possible exception of limited user-specific application configuration settings.

Being widely accepted by practitioners in the software industry, quite often we can see that researchers in academia use interchangeable notions depending on their research domain instead of SaaS. Depending on the research context, terms "cloud services" [31], "online services" [40] and "information services" [6] among others are widely used as synonyms to SaaS.

2.2 SaaS Pricing

In most types of businesses, pricing has always been recognized as an essential component of overall business strategy with an impact on profits and revenues [33]. Software companies became an example of those whose commercial success is very dependent on an adequate pricing strategy due to the nature of the market, cost structures, and network effects [53]. Decisions on designing and implementing a pricing strategy have always been challenging for software companies [9].

The transition towards the SaaS business model enabled new opportunities for software companies in software development, delivery, and operations. These opportunities have implications on pricing by creating and magnifying the number of pricing design, experiment, and control mechanisms are available for SaaS companies. These mechanisms include, for example, recurring subscription fees, new mechanisms to ensure efficient price discrimination, and real-time usage tracking: [15,18,28]. However, these new opportunities can also cause obstacles for companies when old pricing principles and practices become obsolete and companies' understandings of how the new ones should be designed are unclear [38].

There is no unified approach to determining the pricing strategy, its implementation, or tactics. We still lack a comprehensive discussion and analysis of this issue. When considering quite extensive literature overviews in background

sections of several research papers (i.e., [22,29,38]), we were able to identify only one paper that explicitly performed a literature review on the pricing of all three pillars of cloud computing including SaaS, PaaS, and IaaS [54]. All these reviews and overviews lack a systematic approach and cover only a narrow body of literature.

2.3 SaaS Pricing Body of Knowledge and "Cookbook"

A comprehensively defined and structured set of knowledge is now commonly referred to as a Body of Knowledge. Such Bodies of Knowledge exist in a range of disciplines and associated professional areas and provide complete guides to various areas of knowledge, concepts, terms, competences, and activities within a particular domain [10]. However, few of these Bodies of Knowledge define knowledge with the stress on general factors and most often do not provide easy-to-use solutions in a step-by-step or exemplifying style. For these purposes, Body of Knowledge could be supplemented with more action-oriented "Cookbooks" helpful in making decisions and organizing processes and practices more systematically and efficiently.

So far, SaaS pricing lacks successful attempts to provide a widely accepted Body of Knowledge that defines the scope and content of knowledge regarding SaaS pricing, clarifying its place, and setting the boundary concerning other processes and activities inside SaaS developing companies. As a result, even the same terms of pricing strategy, tactics, and structure can have different meanings to researchers and practitioners, and the amount of such confusing terms is large [51]. Roughly the same situation is found with action-oriented approaches and cookbook-style recipes for consistent analyses and decision-making regarding SaaS pricing.

By now, the very best attempts to develop SaaS pricing Body of Knowledge or "Cookbooks" can be considered books titled "The Anatomy of SaaS Pricing" by Campbell [12] and "Mastering SaaS Pricing" by Poyar [43]. In a narrative style, both books cover a wide range of pricing-related issues crucial for SaaS companies and undoubtedly delivers great value for practitioners. However, these books lack thorough discussions of concepts, terminology, and knowledge areas within SaaS pricing, nor do they provide coherent and comprehensive ready-to-use solutions and step-by-step guidelines.

3 Research Approach

3.1 Research Scope and Research Questions

The theory and practice of SaaS pricing have advanced over the last fifteen years since first SaaS solutions have been introduced. However, SaaS pricing has not arisen from scratch. Existing SaaS pricing practices are largely grounded in earlier pricing practices in software, internet, and service-oriented industries. Exploring and alignment existing pricing frameworks and approaches proposed

by both academic researchers and experienced practitioners seem to be the first step towards a better understanding of how SaaS solutions are and should be priced. Thus, the research question can be defined as follows:

RQ: What pricing frameworks have been proposed and how they can support pricing-related decision-making?

To address **RQ** and to promote further studies on SaaS pricing, we conducted a multi-vocal literature review across various research areas and sources of literature ("white" or "grey"). To answer these questions, we classified the existing literature across various dimensions. Cross-domain and cross-sourced analysis of the research trends, contribution, and challenges allowed us to compare and match them. Both similarities and differences can indicate the potential for further studies, as well as highlight promising research avenues in SaaS pricing. The multi-vocal literature review was conducted following the research protocol outlined from the guidelines [21].

3.2 Search Strategy and Study Selection

The literature review consisted of two stages of searching for literature. In the first stage, we collected "white" literature using multiple scientific databases and digital libraries. We defined the list of the primary search terms that could form the basis of search queries for major scientific databases and libraries as well as set search limitations regarding time, publication type, and research area.

In the search query we dealt with the difference in terminology regarding the notion of SaaS by creating a list of possible synonyms, which were linked during the search procedure using the operator **OR**: "SaaS", "software as a service", "software service", "cloud service", "information service", "digital service" and "internet service". The second part of the search query consisted of words "price" and "pricing" linked with the operator **OR**. Both parts of the search query were linked with the operator **AND**. The search procedure was applied to three fields (title, abstract, and keywords) that contain the most accessible information about the paper.

Once the search terms were settled, we defined a list of sources of relevant scientific literature. We selected the following scientific databases and libraries that cover the most significant journals and conference proceedings: ScienceDirect, SpringerLink, Scopus, JSTOR, IEEE Xplore, and ACM Digital Library. The search procedure was conducted in June 2019. To ensure the exhaustiveness of the collected body of literature, we complemented automated search with backward and forward chaining manual search using the Google Scholar search engine.

"White" literature search produced 99 studies without duplicates. All papers were stored for further revision of Inclusion/Exclusion criteria. The Inclusion Criteria (IC) was applied for screening titles, keywords, and abstracts. The IC helped to identify papers that meet research scope and implicitly investigate any aspects of SaaS pricing. The Exclusion Criteria (EC) allowed us to exclude papers

from those that have already been included based on the full-text analysis. We excluded papers where SaaS and its pricing were the context of the study rather than the topic and papers that did not provide any documented evidence to support research findings. As a result, the "white" literature for further analysis consisted of 76 items that meet the following requirements:

- **[IC]** Full texts of the paper are available;
- **[IC]** Published in peer-reviewed journals or conference proceedings;
- **[IC]** The study is not a duplicate of another study;
- **[IC/EC]** The study covers any aspect of SaaS pricing;
- **[EC]** Research goals and approach are clearly defined;
- **[EC]** The research provides evidence for the results obtained and pieces of evidence for the results are rigorously reported;

In the second stage, we collected "grey" literature following a similar protocol. Using the Google search engine instead of scientific databases, we ran the same search query and explored the first one hundred items provided. We manually explored each web-resource identified within the search procedure. The collected body "grey" literature consists of 151 items with content that satisfies the following requirements:

- Is publicly available (i.e., not behind a pay-wall/registration);
- Discusses certain SaaS pricing aspect;
- Is a standalone material written under a real name or published under the name of the organization;
- The material content is original.

3.3 Data Extraction

The multistage formal content analysis process was implemented to extract a taxonomy of pricing frameworks with further analyzing and reporting.

For both sources of literature, we extracted the following information: *Title*, *Author(s)*, *Date (Year)*, *Publication Type*, *SaaS Type*, *Market Type*, *Considered SaaS Pricing Aspects*, *Identified SaaS Pricing Factors*, *Key Findings*. Additionally, for the "white" literature items we extracted such fields as *Publication Venue*, *Research Approach*, *Research Aim*, *Research Questions*. The corresponding list of additional fields for "grey" literature includes *Company/Project*, *Analytical Approach*, and *Web Address*. Tables with the information on the collected body of "white" and "grey" literature items including extracted fields are available online[1].

After the data extraction was completed, we made excerpts of publications describing pricing frameworks, schemes, or approaches. These publications were further reviewed to extract information regarding the framework and answer the defined research question **RQ**.

[1] https://1drv.ms/x/s!AplKvkJggBgQuABgBypTTEs0STz4.

3.4 Comparison and Analysis

The most widely accepted definition of the term "framework" states that a framework is "*the system of concepts, assumptions, expectations, beliefs, and theories that supports and informs research*" [34,48]. Besides, a framework is a visual or written product explains, either graphically or in narrative form, main issues behind certain phenomena, key factors, concepts, or variable, and the presumed relationships among them. Within our study, we tried to keep our comparison analysis as full as possible and will include in the scope all pieces of research that intend to provide any systematization or decision-making support for any SaaS pricing aspects. However, the total number of publications that we were able to classify as providing SaaS pricing frameworks was not high.

Quite a lot of publications written by practitioners list possible pricing strategies, mechanisms, options with hints on their applicability in different contexts (i.e., [1,58]) or provide an extensive range of guidelines in narrative form and not being adequately systemized (i.e., [12,50]). While all these resources provide a wide range of recommendations that altogether cover all SaaS pricing aspects and consider all factors that could influence pricing decision, however, we did not treat them as frameworks and did not include them in our comparison. Similarly, many papers in academic literature provide frameworks where pricing is the context or an integral part, still not the objective (i.e., licensing frameworks [49,57]) or propose models designed to highlight specific SaaS pricing issues (i.e., [32,37,56]). We were not able to include them in our comparison. In total we identified and selected thirteen SaaS pricing frameworks, seven of which (F1–F7) were proposed in "white" literature and the rest (F8–F13)—in "grey".

Pricing frameworks are difficult to compare due to their comprehensiveness, variability in basic assumptions, and even confusing terminology. We compared frameworks within a defining list of five characteristics. The following characteristics were considered: Perspective, Scientific Origins, Framework Structure, Pricing Aspects Covered, and Pricing Factors Considered.

The *Perspective* of the framework specifies whether the framework employs a prescriptive or descriptive perspective. Prescriptive or action-oriented frameworks provide guidelines on how pricing should be done. In contrast, descriptive or analysis-oriented frameworks do not assign specific actions to be taken. Instead, they conceptualize certain pricing aspects and systematically classify various pricing-related options. The *Framework Structure* describes the structure and the logic of the framework. The *Scientific Origins* means the background on which the framework is based and approaches used to design. Some of the frameworks originated from purely philosophical principles or mathematical/statistical rules, while others are grounded into extensive literature overview, previous frameworks, or even based on personal experience.

Pricing Aspects Covered and *Pricing Factors Considered* respectively specify SaaS pricing areas addressed in these frameworks and factors influencing pricing-related decision-making processes. Both characteristics were grounded in the typologies provided in [51]. *Pricing Aspects Covered* were classified across three groups: Pricing strategy, Pricing tactics, and Pricing operations. *Pricing Factors*

Considered were classified across four categories named Market, Consumers, Company, and Product.

The comparison of identified pricing frameworks is presented in Tables 1 and 2. Frameworks classifications based on *Pricing Aspects Covered* and *Pricing Factors considered* are presented in Tables 3 and 4 respectively.

Table 1. Academic SaaS pricing frameworks comparison

#	Name	Ref.	Perspective	Framework structure	Scientific and practical origins
F1	Customer-centric value-based pricing framework	[7,8]	Analysis-oriented	Customer-centric two-staged framework: 1: Pre-purchase phase (Communication & Transparency) 2: Post-purchase phase (Dynamism & Service)	Literature overview (esp. [14,26,28,36]) Series of in-depth interview
F2	Customer-value based pricing framework	[22,23]	Action-oriented	Depicts the interconnection between three pillars: 1: Customer characteristics 2: Company objectives 3: Pricing objectives and strategy	Literature overview (esp. [19])
F3	Pricing process framework	[59]	Analysis-oriented	Three-stage pricing process structure: 1: Data collection 2: Strategy analysis 3: Strategy establishment	Literature overview (esp. [11,16])
F4	Competitive forces based framework	[38]	Analysis-oriented	Four-layer model: 1: Competitive forces 2: Factors impacting 3: Revenue models 4: Competitive advantage	Literature overview (esp. [41,42])
F5	Software products pricing typology	[30]	Analysis-oriented	Typology based on six pricing parameters: 1: Formation of price, 2: Structure of payment flow, 3: Assessment base, 4: Price discrimination, 5: Price bundling, 6: Dynamic pricing strategies	Literature overview (esp. [9]) Series of in-depth interviews
F6	Cloud solution pricing framework	[28]	Analysis-oriented	Typology based on seven pricing parameters: 1: Pricing scope 2: Structure of payment flow 3: Assessment base 4: Price discrimination 5: Price bundling 6: Dynamic pricing strategies	Literature overview (esp. [25,30]) Market survey
F7	Pricing strategy guideline framework	[2,55]	Action-oriented	Five layers of pricing within Corporate and Sales & Marketing Strategies: 1: Value Creation + Business Case, 2: Pricing Structure, 3: Price and Value Communication, 4: Price Policy + Sales Mechanism 5: Price Level	Literature overview (esp. [4,24,26,41,42])

Table 2. Practice SaaS pricing frameworks comparison

#	Name	Ref.	Perspective	Framework structure	Scientific and practical origins
F8	Pricing canvas framework	[20]	Action-oriented	Six-segment pricing canvas: 1: Customer Segments, 2: Value Proposition, 3: Cost Structure, 4: Competitors and Market, 5: Pricing Strategy, 6: Price Model	Not specified
F9	Pricing strategies decision framework	[17]	Action-oriented	Six-step framework: 1: What is the Customer's Value of the Product? 2: Is the Customer Aware of this Value? 3: Can the Customer Base be Segmented? 4: Is the Customer's Demand Variable or Uncertain? 5: Establish a Price Floor 6: What are the value metrics that are most important to the customer?	Case-studies (own experience) Pacific Crest SaaS Company Survey, Totango Reports on SaaS Metrics
F10	PWC pricing management framework	[47]	Analysis-oriented	Four pricing management segments: 1: Pricing strategy, 2: Price formulation, 3: Transaction management, 4: Performance management	Case-studies (own experience)
F11	Mastering pricing framework	[43]	Action-oriented	Pricing pillars: 1: Pricing at the Seed Stage 2: Pricing at the Expansion Stage 3: Pricing at the Growth Stage	Large-scale survey and market research
F12	ACCION pricing framework	[3]	Action-oriented	Four-step framework: 1: Define your upper bound 2: Define your lower bound 3: Identify any reasons to charge less than max value 4: Structure your pricing model as a compromise between upper bound and lower bound	Not specified
F13	Product Focus pricing framework	[44, 46]	Action-oriented	Pricing pillars: 1: Pricing constraints 2: Pricing cycle 3: Pricing Evolution	Case-studies (own experience)

Table 3. SaaS pricing aspects coverage

Category	Aspect	Framework												
		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Pricing strategy	Structure and models	×	×	×	×	×	×	×	×	×	×	×	×	×
	Evaluation and evolution	×									×	×		×
Pricing tactics	Customer analytics and segmentation	×	×	×					×	×	×	×	×	×
	Transparency and communication	×						×	×	×		×	×	×
	Offering design and promotion							×	×	×	×	×	×	×
Pricing operations	Ownership and decision-making									×				×
	Monitoring and control										×	×		×

4 Research Findings

Several publications authored by practitioners aim to deliver the desired SaaS pricing «Cookbook» or even more comprehensive body of knowledge (i.e., [12,43,45]). Being systematically combined in a single book the myriad of blogposts by L. Murphy[2] and C. Mele[3] could serve the same purpose. These publications could provide valuable support for SaaS companies in designing and implementing their pricing. However, their crucial limitation is the lack of systematic approach and frameworks that structure the content, insights, and ideas provided. In this study, we were able to identify SaaS pricing frameworks that addressed various pricing aspects and employed different pricing methods. All thirteen frameworks for SaaS pricing vary significantly in their theoretical content, their purpose, and the way they conceptualize pricing. This variety reflects the diversity of research questions and purposes addressed by these different frameworks. One framework cannot serve all purposes of research and be applicable for all kinds of cases.

Seven out of thirteen frameworks (F1–F7) were introduced in academic literature, and six by practitioners (F8–F13). We classified six as *Analysis-oriented* (developed mostly by researchers) and seven—as *Action-oriented*. In comparison to practical frameworks, academic ones include better documentation of their logic, goals, and principles as well as traces of their groundings in previous studies. However, these academic frameworks do not do much to describe their actual implementations in practice, and they are not referred to extensively in grey literature [51]. On the other hand, frameworks provided by practitioners are not so well-documented. With some of them, we had to extract information from only very brief presentations. It is possible that many of these frameworks provided by practitioners are made for consulting business. They do not provide reliable evidence of their implementations in practice. Often their relevancy comes from the reputation of the companies (i.e., PWC [47] or Product Focus [45]) or the expert (i.e., K. Poyar [43]) behind them.

[2] https://sixteenventures.com.
[3] https://softwarepricing.com.

Table 4. SaaS pricing factors consideration

Group	Factor	Framework												
		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Market	Market size and maturity	×	×	×					×	×	×	×	×	×
	Market structure and competition	×	×	×	×			×	×	×	×	×	×	×
	Types of customers	×	×	×		×	×		×	×	×	×		×
	Barriers and constraints							×						
Consumers	Perceived value	×	×					×	×	×	×	×	×	×
	Willingness-to-pay		×	×				×	×	×		×		
	Adoption readiness				×									
	Switching costs							×		×		×		×
	Network effect							×		×		×		
Company	Business goals and opportunities		×		×	×	×	×	×	×		×		×
	Company size and maturity										×	×		×
	Resources availability		×		×							×		
	Cost structure	×	×	×	×			×	×	×	×	×	×	×
Product	Product category					×	×		×	×	×	×		
	Lifecycle stage										×	×		×
	Competitive advantage	×			×			×	×	×	×	×	×	×
	Experience required							×		×				
	Scalability potential											×		

Frameworks vary significantly regarding SaaS pricing aspects covered (Table 3). While all frameworks address pricing *Structure and Models* and many of them additionally incorporate issues related to *Customer Analytics and Segmentation*, few of them deal with pricing *Evaluation and Evolution* or other SaaS pricing tactics and operations. In general, practical frameworks address more pricing aspects and they are more informal and less structured than academic frameworks. Their decision-support is often just a structured set of recommendations or a list of items to consider (i.e., *Monitoring and Control* or *Offering design and Promotions* in [43,45]).

Correspondingly, less systematic practical frameworks (i.e., F11, F13) consider more pricing-affecting factors (Table 4) than academic ones. Still, the support for decision-making often remains unclear. Moreover, it is challenging for SaaS companies to proceed with these factors in decision-making without

collecting data to assess these factors (i.e., measuring network effects strength that this particular SaaS solution creates, or consumers' willingness-to-pay). Additionally, the pricing frameworks do not incorporate engineering aspects of SaaS factors related to the market, consumers, and company itself. While some frameworks consider *Scalability potential* and *Lifecycle stage*, none connects pricing decisions with *Quality attributes* and *Functional requirements and features sets*.

5 Discussion and Conclusion

Pricing is often a difficult and uncertain process. SaaS providers vary widely in how they organize, execute, and evaluate pricing decisions. The implementation of proper SaaS pricing is one of the most complex activities that any company can attempt. It impacts many processes inside the company, affects different business units, and requires sophisticated analysis. Many organizations, while understanding the complexity of pricing and its strategic role in product and company success, find themselves not capable of performing proper pricing. More importantly, the academic community has failed to equip the industry with trustworthy pricing approaches, frameworks, and guidelines.

To the best of our knowledge, this research is the first attempt to bridge academic research and practice employing a multi-vocal literature review to obtain a better understanding of SaaS pricing in general and what frameworks now exist to guide SaaS companies designing and implementing pricing strategies, policies, and practices. We provided a comparison of thirteen frameworks found in academic and practitioner literature. Some of these have been developed for specific aspects, whereas others have a broader purpose. This comparison goes beyond identifying the benefits and limitations of provided frameworks. As stated below, although the amount of literature on SaaS pricing is growing, the comprehensive body of knowledge on SaaS pricing is missing. Following the approaches of existing mature bodies of knowledge in other disciplines, an SaaS pricing body of knowledge should promote a consistent view of SaaS pricing and clarify its place with respect to other business functions by defining key terms and concepts, knowledge areas, and SaaS pricing-related tasks and techniques. Grounded in this body of knowledge, a cookbook-style guideline and a compendium of recommendations could be introduced. They will equip product managers with verified step-by-step pricing frameworks and easy-to-use approaches, addressing different pricing aspects from different perspectives, supplemented with structured decision-making systems.

Bringing together theoretical analysis and practical experience is an essential step toward developing a SaaS pricing "Cookbook". However, much more research is needed to achieve the goal of having the "Cookbook" mentioned above. Academic research on SaaS pricing seems to somewhat lag behind in terms of practical expertise, observations, and opinions. While existing academic literature on SaaS consists of relatively small and fragmented studies that belong to different research domains, practitioners are active in publishing and sharing

SaaS pricing advice, observations, and even frameworks. Moreover, many non-academic studies performed without scientific rigor provide more value for the industry. Pricing contains many opportunities for research. Many of the studies in this review identify relevant research topics. Furthermore, none of the significant areas of pricing are "closed". There are great opportunities to extend the current state-of-the-art in pricing. We intend to provide some guidelines in follow-up publications concerning this study.

Understanding how prices are set, communicated, and updated is a fundamental pre-condition for prescribing pricing approaches. The vast majority of «grey» literature publications do not provide comprehensive pricing frameworks nor report extensive reviews; instead, they offer bits of advice, guidelines, and suggestions usually outside of the personal experience or non-systematic observations. The value of each recommendation can be modest; some of them can even look trivial or unconvincing. Furthermore, these sources do not equip SaaS companies with usable decision-making instruments instead of diverse ranges of recommendations. However, they can bring about an understanding of real-world pricing practices, reveal the pricing challenges that companies and product managers face, and, if adequately synthesized, be useful in designing SaaS pricing ready-to-use solutions and step-by-step guidelines.

Academic papers, especially those in the fields of economics and management science, quite often aim at demonstrating the market consequences of implementing certain SaaS pricing mechanisms at a model level. In explicit form, these models can hardly be applied by real-world companies; still, insights grounded in the analysis of these models could be of value. In order to attain this value, these academic literature outcomes should be classified and matched with recommendations derived from «grey» literature. Doing so will not only allow the verification of practical recommendations (often of an intuitive nature) but will also allow the design of powerful decision-support instruments.

While within this paper, we provide a fundamental comparison of SaaS pricing frameworks, many issues can only be explored through practical use and further investigation. This includes, but is not limited to: frameworks' effectiveness, easy-to-use, and adaptability. As far as we are aware, there have been no attempts to assess pricing frameworks from these perspectives or to validate the total effects of using different SaaS pricing frameworks.

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