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Investigating The Relationship Between Pricing Strategies And International Customer Acquisition In The Early Stage Of SaaS: The Role Of Hybrid Pricing

Udara Rangana Jayathilaka
Department Of Global Business Management,
Gangseo University, Seoul, South Korea.

ORCID
0000-0002-1682-9812

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Abstract

Modern cloud infrastructures make it possible for SaaS businesses to provide their services to clients all over the world. As a result, it is easy for a SaaS company to operate on a worldwide scale in an early stage. Innovative SaaS services are more difficult to price than regular products. Poor pricing may lead to a misleading impression of the product, while a well-thought-out price plan can assist a business in achieving its immediate and long-term revenue objectives while also satisfying its customers. The goal of this study is to investigate which pricing strategy helps SaaS organizations attract more customers. Correlation, Random Forest Regression, and Pairwise Multiple Linear regression were applied. The correlation heatmap shows that the sales volume is highly and positively associated with hybrid pricing. This indicates that the implementation of the hybrid pricing technique is associated with more sales volume. The majority of SaaS companies in the study sample used freemium, high-low, and hybrid. The skimming and the penetration pricing techniques were the least employed pricing tactics in SaaS. The regression model with hybrid pricing has also shown a high explanatory performance. With an overall score of 91.89 percent, the findings of this empirical study showed a sufficient degree of accuracy. According to the random forest results, among other techniques, hybrid pricing is the most significant pricing technique in increasing sales volume in SaaS. This study recommends that the SaaS business should employ a hybrid pricing approach in order to attract more consumers, enhance the entire experience they deliver, and therefore increase SaaS sales revenues.

Keywords: *Cloud computing, Freemium pricing, High-low pricing, Hybrid pricing, SaaS*

Declarations

Competing interests:
The author declares no competing interests.

1. Introduction

The first impression of a product or a service is shaped by price in modern days. The price of a product is the first thing a customer will notice about that product or service; as a result, the price plays a significant part in the formation of the customer's first opinion of a product or service in his or her mind [1]. Although the customers will base their ultimate purchase choice on an analysis of the overall advantages provided by the goods, they will more than likely contrast the real cost of the item with its perceived worth in order to gauge his degree of contentment with the purchase of the specific item. But initially, customers take into account the cost of the item, and if they are pleased with the pricing, they move on to investigating the attributes of the item further in order to determine whether or not it is a good investment to purchase it.

An optimal price is also an essential component in marketing promotions. Pricing is often regarded as the most significant aspect of every sales campaign that is carried out in modern business environment [2]. If a marketer wants to boost the number of sales, one strategy that he may use is to lower the price of the product in the hopes of increasing demand for it in the market. Therefore, pricing plays an essential role in increasing sales since in the majority of situations, the demand for a certain product is sensitive to price, and if the marketer makes even a slight drop in price, it will lead to larger sales volume. Consequently, price is an important factor in promoting sales. Nevertheless, a marketing executive should constantly keep in mind that in order to encourage sales, the price of the product should not vary too often.

A firm might bring about its own downfall by making a poor selection about its pricing strategy. It is of the utmost importance to set prices at the appropriate level after doing enough market research and conducting an analysis of several elements, such as the pricing strategies of rivals, the market circumstances, the cost of manufacturing, etc.

It may be easier for the firm to bring in clients in the beginning if they provide low costs, but it will be very challenging for them to do so in the future. In a similar vein, setting the price very high will result in greater profit margins, but it will also reduce sales. Therefore, determining the appropriate pricing is essential if one wants to strike a healthy balance between the amount of money made from sales and the total number of items sold.

Customers pay a monthly subscription charge for continuous usage of the services/products under the SaaS business model. This mix of continuous payments and possibly complicated service bundles might make it difficult for SaaS providers to determine the ideal pricing plan.

When a business mixes two or more price strategies, it is using what is known as a hybrid pricing model. Businesses in today's world are always on the search for a range of various pricing tactics in the hopes of boosting their conversion rates as well as the overall worth of their customers throughout the course of their lifespan.

Cloud computing and SaaS

SaaS is a software distribution technique that enables customers to access cloud-based programs through the internet [3], [4]. The proliferation of the internet and the continually falling costs of personal computers fueled the growth of the software as a service (SaaS) industry in the late 1980s and early 1990s [5], [6]. Personal computers are now more affordable than they have ever been. This allowed each worker to have their own personal computer at their workplace, eliminating the need for a large number of people to use a single machine [7]–[9]. As more time passed, there was less of a need to depend on many systems, and the software as a service (SaaS) business evolved correspondingly.

Different parts make up cloud computing. Fundamental elements consist of physical structures, software, data, networks, and applications. In this sense, software as a service (SaaS) is just one aspect, not quite the cloud entirely. Delivery of SaaS occurs on the cloud. An independent software vendor may pay a cloud company to host the program in the cloud company's data center, or the software company may host the program and accompanying data employing its own servers, libraries, networking, and computing resources [10]. In other words, the software may be used on any connected device. Typically, web browsers serve as the entry point for SaaS services.

While software as a service (SaaS) seems exciting, there is still significant to be accomplished to safeguard SaaS companies, their customers, and the cloud suppliers directly from the traps of the unethical cyber criminal. There is still more work to be done to persuade SaaS providers and their clients that cloud suppliers can adequately address their security concerns [11]–[13]. They need to keep in mind that the rise in malware and other attacks also means a rise in cloud computing security concerns. Cloud security concerns are a big roadblock to expansion and development for many companies. It is crucial for businesses to have a secure method of storing their data online, and this is where cloud computing comes in. Cloud security solutions include the extensive set of rules and procedures put in place by businesses to safeguard their electronic assets and systems.

Pricing strategies for SaaS for international market expansion

A SaaS may adopt one of the following pricing strategies or a hybrid strategy. The hybrid pricing model gives the SaaS company the ability to integrate two or more price models in order to find the one that works best for the company model or for its subscribers (customers).

Skimming pricing

Many SaaS companies that develop new service establish relatively high pricing in order to extract income from the market step by step [14]. With each new edition of a product, new models begin at a high price then gradually decrease in price as newer versions are launched. In this manner, a firm extracts the most amount of money from the different market sectors.

Companies that use price skimming strategies do so in order to recover investments as quickly as they can and sell as many items as they can at the maximum price level the brand is likely to see. This instantly increases revenue and profits, which the business can use to grow distribution and marketing and support R&D expenses [15].

Skimming the market makes good sense only under limited circumstances. First, the product's value as well as image must justify the higher price, and a sufficient number of purchasers must want the goods at that price. Second, the expenses of manufacturing a lesser volume should not be so great that the benefit of charging more is negated. Finally, rivals should be unable to simply join the market and compete the high price.

Most B2B SaaS firms seek to grow their global customer base as rapidly as possible in order to create recurring income [17], [18]. Limiting that potential development with price shock might harm the early foundation and limit compounding growth possibilities.

This pricing is set after considering the diffusion of innovation theory, which describes the pace at which a product spreads throughout a social system into consideration [19]. According to this theory, innovators are those who desire to be the first to acquire a new product or service. They are price agnostic and risk takers. The skim pricing approach is geared towards these innovators, with the goal of maximizing the profit from such early adopters and innovators. When interest from these two categories reaches maximum capacity, the product's price is reduced to target price-sensitive clients, including early and late majority customers. SaaS firms may choose to utilize penetration pricing to acquire users at a cheap cost and subsequently increase revenue from those clients later on with more services, account holders, or greater price.

If price skimming is not done correctly, it may have serious consequences, and the road to recovery can be lengthy and difficult. Given the novelty of the offering, it may work for a B2C SaaS. Something so distinctive and valuable that it significantly simplifies people's lives. And individuals are more than happy to pay a fee for the privilege of using it [20].

Penetration pricing

Penetration pricing considered to be a promotional pricing approach in which a firm briefly lowers its prices in order to develop demand rapidly. It is usually denoted by a time range, which business might or might not reveal to its customers. This pricing strategy is chosen to reduce adoption friction, to expand rapidly, and subsequently to go up market after gaining a large user base [21].

Some businesses utilize market-penetration pricing rather than charging a high starting price to capture tiny but lucrative market niches. Companies establish a low beginning price in order to swiftly and completely enter the market - to attract a big number of consumers and acquire a substantial market share. Because of the huge number of sales, expenses are reducing, enabling enterprises to lower their prices even more [22]. Companies often resort to lowering prices to unsustainable levels in the short and medium run. Their goal is to build their consumer base so that they can recover in the long term by progressively raising their pricing.

Several requirements must be satisfied for this low-cost method to be effective. To begin, the industry must be very price sensitive, such that a reduced-price results in increased market growth. Secondly, as sales volume grows, production and marketing costs must fall. Lastly, the low price must serve to keep the competitors at bay, and the penetration the business must retain its low-price position. Otherwise, the profit margin may be limited [24].

This method is often used by new market entrants. Penetration pricing works best under very particular market situations. Firstly, if there is little difference between the goods a business offers and rivals' offerings, it is tough to distinguish in any manner other than pricing. Customers normally have some amount of brand loyalty, therefore gaining market share will be tough unless the business (temporarily) offers cheaper pricing than the competitors.

Secondly, if demand is responsive to price changes, which implies that the degree of demand is highly influenced by price, it is simpler to tempt customers away from their existing brand of choice, and a penetration pricing approach is more likely to work.

Finally, if firm's overall cost structure indicates that it will have favorable economies of scale. The economies of scale implies that the marginal cost of the product will reduce as the amount of production grows, the price the firm can give sustainably will decrease as it obtains more clients. Furthermore, a substantial market position will be a critical necessity for long-term success.

Temporary low pricing might become the market's long-term expectation. Customers may see firm as a "cheap brand" and be unlikely to stay with the firm if the prices rise [25]. Customers that are ready to change brands for a price are not very loyal and will most likely desert the company in favor of the next price campaign offered by another SaaS competitor.

While penetration pricing might help a SaaS gain market share quickly, there is no assurance that it will be able to retain that share after prices rise. Furthermore, if marketing approach fails, cheap rates may need to be available for a longer period of time than the SaaS can afford.

Finally, while penetration pricing is an excellent short-term strategy, it may be preferable to entice prospective customers into long term contracts with these reasonable prices in order to have more time to persuade them of the benefit the SaaS service delivers to their businesses before they make a decision to reorder at the market rate [26].

High-Low Pricing

The price with this technique is high, but the product or service is offered with huge discounts and offers. The high price indicates to the market that this product has enormous value. This is done to guarantee an increase in traffic and to create adequate interest in the audience. High-low pricing has the potential to boost a company's total profitability. This happens when consumers who are given the option to buy things at a lower price also buy full-price items while purchasing [27].

Because organizations that utilize high-low pricing must continuously promote the items they intend to offer at a reduced price, the usage of the pricing strategy comes with the benefit of having a fixed marketing strategy. This is due to the continual change of which items a firm reduces the pricing for, since they may reuse the marketing technique from one round of discounts or coupons for the following batch of reduced products [28]. A ready-to-use marketing plan may save a firm time and money that would otherwise be spent developing one.

Another crucial benefit of high-low pricing is the ability to attract new clients to a SaaS company. This is because a SaaS that employs high-low pricing generally gives specials or coupons to the customers, which may entice people to visit a company even though they have never done so before. Companies who employ high-low pricing efficiently have a better chance of retaining their current clients, who may come back to repeat their typical purchases and discover new reduced goods when they are released.

This pricing strategy creates unjustified customer expectation. One of the most significant disadvantages of employing the high low pricing strategy is that if buyers find out the pattern used to raise and drop prices, they may not purchase when prices are higher and instead wait until prices are decreased. Once buyers have experienced the joy of cheap pricing, raising prices again might result in a decrease in sales volume.

Low pricing might sometimes turn off a certain subset of consumers who link price with quality. In another example, it may induce the true target audience to believe that the items are cheap due to their being of poor quality.

In the second stage of high low pricing, when product prices are reduced, companies must pay significant marketing costs to publicize the price decrease. If the sale does not attract enough buyers to pay these advertising costs, the profit may be reduced or even lost in certain situations.

Freemium Pricing

The term "freemium" is a combination of the phrases "free" and "premium." The free version is often cut down or restricted in feature, allowing consumers to meet basic requirements while motivating them to purchase to a premium version [29].

SaaS and freemium typically complement one other since it cost almost nothing to provide each new customer with easy accessibility to a current core software solution. Because end consumers like to do the great amount of their online research before speaking with a sales representative, free goods are the best approach to reach them [30].

Nowadays, this has become the most frequent price plan. There are several freemium alternatives to implement. In one of the forms, the product is free for a limited time period, after which the consumer must acquire a license to keep using it. Another form is based on use thresholds; the customer may use the product until a specific usage threshold is reached, at which point the client is needed to purchase [31].

Free trials, like freemium, assist minimize customer acquisition costs by allowing the products to handle the majority of the work of turning leads into customers. However, there are substantial variations between these two pricing models:

Freemium items are always free, while free trials provide the product's access for a limited time. Free trials offer consumers full accessibility to all (or most) of a product 's aspects; freemium users have limited functionality and may unlock new features by upgrading to premium. The most apparent advantage of a free trial would be that business are not required to support people who never create any revenue for a company [33]. When their free trial time ends, users must either register for the product or leave.

A free trial as a pricing plan is often more successful at turning leads into paying clients. The first reason for this is that consumers experience the entire product capability and are informed of what they must pay for during the free trial [34]. Another point to consider is that in most circumstances, needing a credit or debit card to register for a free trial will result in more eligible but fewer leads [35].

In terms of freemium pricing advantages, this pricing plan is obviously simpler for consumers since it does not put any pressure on them up front by demanding a credit card to join up. For the SaaS firm, there is the option of gradually converting free consumers if (when) their demands change. This situation is heavily reliant on the effective integration of the product into the consumers' workflow [36]. Finally, switching to anything else will be much more unpleasant for them than switching from freemium to subscription inside software.

There are many forms of freemium pricing strategy. The first one is the constrained feature set. This is the most common and typical option. It provides just enough functionality to capture their curiosity and establish familiarity while winning their confidence. However, if consumers want more features, they will have to pay. This is another popular choice since it enables smaller businesses to gradually evolve towards a premium set of features rather than requiring a huge initial expenditure [37]. This price plan has proven to be incredibly effective for Slack. Their free version delivers a powerful punch and is regarded as more useful than restricted by millions.

Another frequent freemium strategy for introducing smaller businesses to SaaS is to restrict the application to a single license. They will have to purchase additional licenses if they surpass the quantity of seats. In addition to restricting the quantity of seats, SaaS providers want to regulate their clients' consumption. Those who require very little storage capacity are eligible to use the program service for free, whereas those with higher needs (and more overhead) are paid a cost that often climbs based on how much storage capacity (including bandwidth) is spent in a given month.

As previously discussed, freemium is a successful method of acquiring new clients. It gives the SaaS an advantage over rivals who aren't providing a free option, and it will help recruit a bigger customer base to inspire them into being paying clients.

Customers who use the freemium version do not anticipate the same degree of service, assistance, or dedication from staff as those who use the premium version. It is up to them to find the product, which saves money and time away from support crew. That is not to suggest there is not value in thoroughly understanding how to operate the product, but businesses are able do so pretty inexpensively and at scale using email channels and other onboarding communications strategies.

Because the ultimate purpose of adopting a freemium acquisition strategy is to grow the number of paying users, the freemium conversion ratio, or the rate at which customers convert from a free version to a paying plan, may be used to analyze the performance of freemium model.

In fact, different pricing structures will be more effective for various SaaS enterprises. While freemium may work for some and aid in quick viral development, it is not a one-size-fits-all answer. On the opposite end of the spectrum, some SaaS firms may discover that the money produced by their paying clients alone is insufficient to cover the expenses of servicing all of their users (free and paid).

Methodology

We employed Random forest regression to investigate the impacts of different pricing strategies on SaaS startup. The algorithm for the random forest regression is given as follows:

Algorithm for random forest regression

1. For r = 1 to R

- i. Create a bootstrap sample Z* with a size of N based on the data from the training set.
- ii. Construct a random-forest tree T_r to the bootstrap sample data by iteratively repeating the subsequent stages for each terminal node of the tree until the minimum node dimension n_{min} is attained. This process

must be continued until the tree reaches the desired length.

- a) Out of the p variables, choose m variables at random to work with.
- b) Determine which of the m variables or split points is the most important.
- c) The node should be divided into its two descendant nodes.

2) The group of trees should be output:

$$\{T_r\}_1^R$$

In order to create a forecast at a new point x:

$$\hat{f}_{rf}^{R}(x) = \frac{1}{R}\sum_{r=1}^{R} T_r(x)$$

[38]

The author distributed the survey questionnaire to 400 SaaS companies that are in initial phase. 300 were returned. After dropping missing points, the final study had 281 observations.

Results and discussion

Table 1.

Pricing	Number of SaaS
freemium	69
highLow	60
hybrid	65
others	30
penetration	36
skimming	20
Grand Total	**280**

Pricing	Sum of sales
freemium	761.214102
highLow	668.986803
hybrid	908.4263
others	304.075634
penetration	425.85652
skimming	199.873986
Grand Total	**3268.433345**

Table 1 shows that most of the SaaS businesses applied 3 pricing strategies: freemium, high-low and, hybrid. The least used techniques were skimming, and penetration pricing. The table also shows that the SaaS sales volume is highest in case of hybrid (908.42), the freemium and high low pricing comes at second and third place, respectively, in gaining more sales.

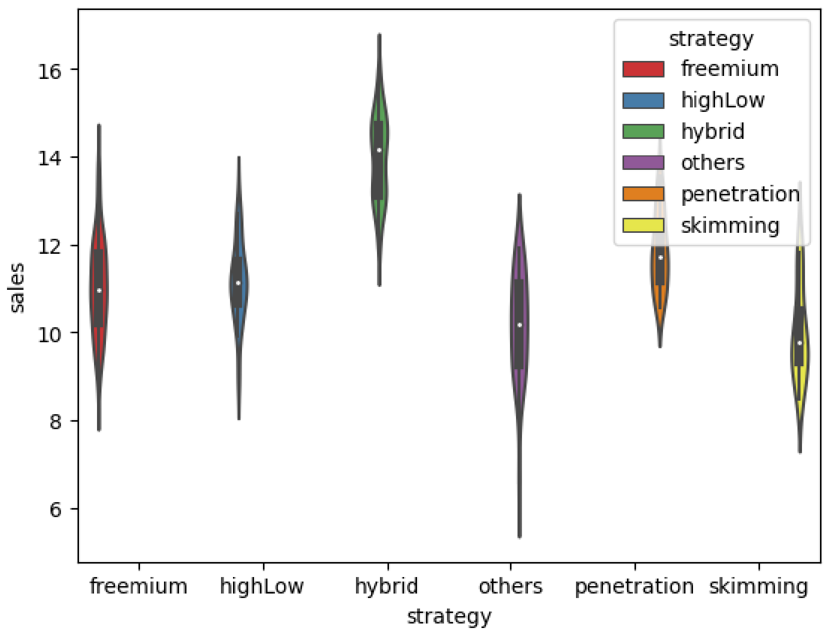

Figure 1. Sales volume in different pricing models.

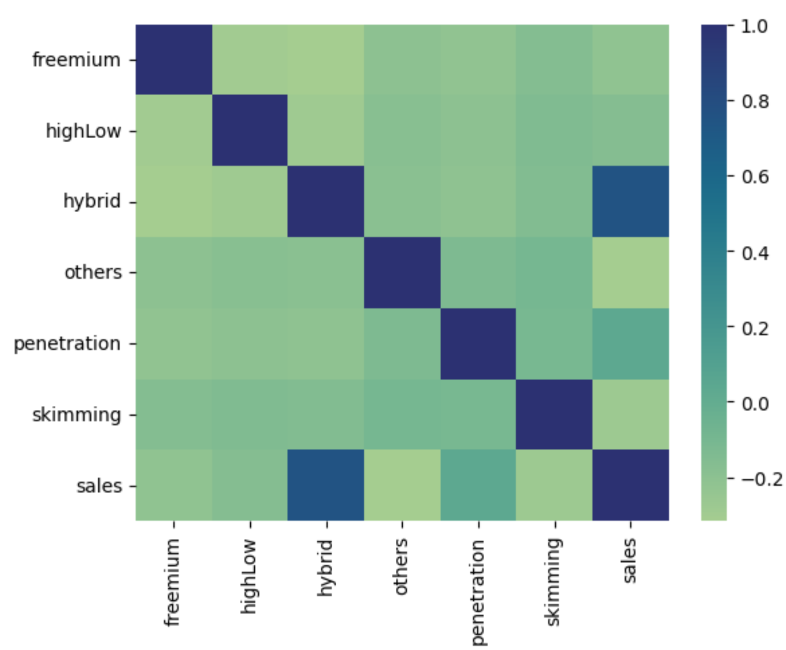

Figure 2. Correlation between sales volume and different pricing models.

Figure 2 emphasizes the connection between the outcome variable sales volume and the characteristics variables by displaying that correlation heatmap. The outcomes of the analysis suggest that there is a positive and significant correlation between hybrid pricing and sales volume. The sales volume has weak correlation with other pricing models.

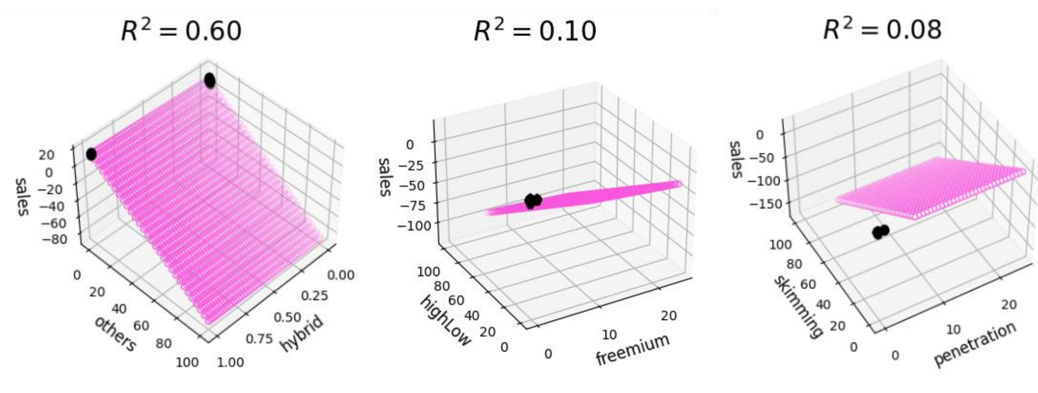

Figure 3. Pairwise regression analysis

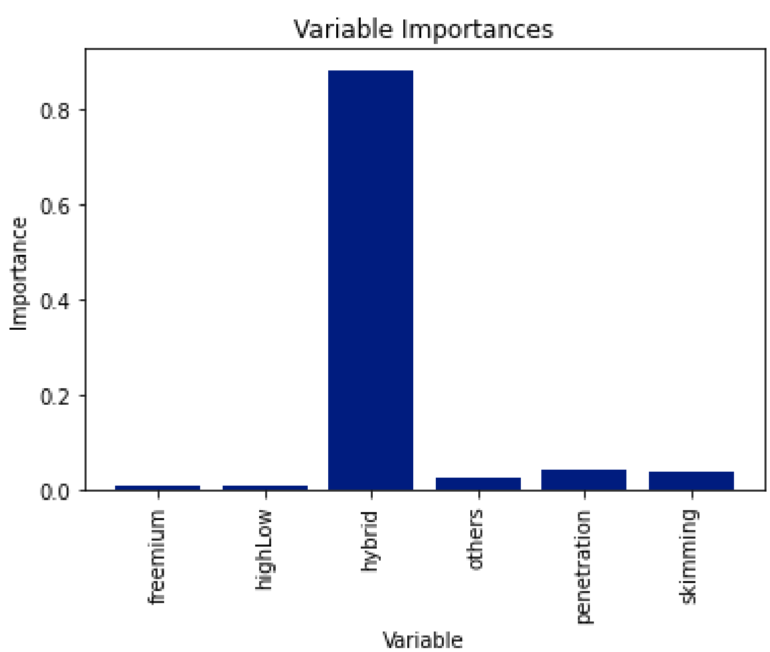

Figure 4. variable importance in Random forest regression

Mean Absolute Error: 0.9 degrees.
Accuracy: 91.89 %.

The findings of this empirical investigation demonstrated an adequate degree of accuracy, with an overall score of 91.89 percent. According to the findings of the random forest, the variable that counts the most when it comes to acquiring more sales revenue is the hybrid pricing.

After doing the multiples regressions and computing the R-square for each pair of characteristics using the sales volume, the results were analyzed. When hybrid pricing is combined, as seen in figure 3, both prediction and model performance are improved. The R-square is 0.60 in case of hybrid pricing. A high R-square shows the model's strong overall performance.

It results in an increase in the collection of data. If a SaaS chooses a hybrid approach, it has a better chance of collecting more data as a result of an increase in the number of people who join up for service and subscribe to it. For instance, if a SaaS combines a freemium pricing plan with a tiered pricing strategy, it can accept more budgets and eliminate that barrier for entry, which in turn dramatically boosts the number of people that join up for its service with the freemium version being offered. Increased data collecting opens the door to the possibility of personalizing marketing initiatives, which in turn makes such ads that much more enticing to potential customers.

It gives the SaaS more leeway to be flexible with the pricing structures. The SaaS businesses are able to explore and test out a variety of alternative pricing style combinations when using hybrid pricing models. Experimenting with a variety of different pricing models may be quite beneficial and is even recommended in certain circumstances. Companies who only alter their pricing plan once a year fall behind competitors that make frequent updates and modifications to their pricing strategy since doing so results in a rise in the average revenue per user of the company.

In accurately predicting future income, some pricing structures, such as the usage-based model are not as successful as others. The introduction of a hybrid pricing model, on the other hand, makes it possible to combine two or more pricing strategies in order to accurately assess and forecast revenue.

It results in an increase in Conversions. If a SaaS provides its users with an adequate number of buying alternatives, they will be more inclined to make a purchase from it.

Conclusion

Despite its complicated nature, worldwide expansion of a SaaS organization is simpler than international expansion of a conventional business model. In reality, SaaS companies are fortunate in that they are built with the fundamentals for globalization already in place [39]. The hardest part of growing globally, according to businesses, is figuring out the proper price or programs. Data-driven digital transformation may benefit greatly from IoT [40]. Businesses are responsible for the oversight of millions of IoT devices in locations all over the globe. Considering that there would be a huge increase in the number of IoT devices deployed worldwide [41]. SaaS systems that can administer an enterprise's IoT installations have emerged due to the massive volume of IoT deployments and the consequent data increase [42].

There are several SaaS pricings models, giving a business plenty of flexibility to combine the features that work well for with those of other models. The reality is that most SaaS businesses end up using a hybrid pricing model, which enables them to better match the price and value of their subscriptions as they respond to changing customer demands. When expanding into other countries, it is important to adjust prices to the market there. True localization of prices, however, requires knowledge of local markets in order to set appropriate prices.

Without a solid pricing plan, a SaaS business will either drive clients away with unreasonable costs or lose money by undervaluing services. Both of them are catastrophes in the making. Prices have an impact on more than one area inside a company. The choice should be made with input from leaders in various areas, especially sales, marketing, product development, and management.

The process of putting a price on a service is more challenging pricing on a product. Thorough study will assist firms in selecting a SaaS pricing plan. It is also beneficial to construct customer profile from any obtained data in order to understand who the intended audience is, what items they are searching for, and how they will most likely utilize the product. Feedback from both present and prospective customers might be useful when deciding on a SaaS pricing strategy.

Businesses are able to install a version of one or more pricing models with the help of a Hybrid Pricing Model. This allows them to assess which model yields the greatest profits for the business as well as the greatest experience for the customers. In a strict sense, there is no response that can be considered correct to the question. Each of the models described above has the potential to be successful, but this will rely on the nature of the company as well as the needs of its customers.

It is also worth noting that the SaaS sales volume is generally affected by a variety of variables rather than the price alone. Thus, concentrating on only pricing does not considerably increase SaaS sales volume.

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