



“Web-service promotion of SaaS service for mining design”

AUTHORS

Venera Zarubina 
Mikhail Zarubin
Olga Andreeva
Darkhan Akhmetov 
Ekaterina Gutnova

ARTICLE INFO

Venera Zarubina, Mikhail Zarubin, Olga Andreeva, Darkhan Akhmetov and Ekaterina Gutnova (2021). Web-service promotion of SaaS service for mining design. *Innovative Marketing*, 17(4), 49-61. doi:[10.21511/im.17\(4\).2021.05](https://doi.org/10.21511/im.17(4).2021.05)

DOI

[http://dx.doi.org/10.21511/im.17\(4\).2021.05](http://dx.doi.org/10.21511/im.17(4).2021.05)

RELEASED ON

Monday, 01 November 2021

RECEIVED ON

Saturday, 21 August 2021

ACCEPTED ON

Friday, 22 October 2021

LICENSE



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

JOURNAL

"Innovative Marketing "

ISSN PRINT

1814-2427

ISSN ONLINE

1816-6326

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

29



NUMBER OF FIGURES

1



NUMBER OF TABLES

9

© The author(s) 2022. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC “CPC “Business Perspectives”
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 21st of August, 2021
Accepted on: 22nd of October, 2021
Published on: 1st of November, 2021

© Venera Zarubina, Mikhail Zarubin,
Olga Andreeva, Darkhan Akhmetov,
Ekaterina Gutnova, 2021

Venera Zarubina, Candidate of
Economic Sciences, Associate
Professor, Faculty of Economics
and Construction, Department of
Economics and Management, Rudny
Industrial Institute, Republic of
Kazakhstan. (Corresponding author)

Mikhail Zarubin, Candidate of
Technical Sciences, Associate Professor,
Faculty of Energy and Information
Systems, Department of Automation,
Information Systems and Security,
Rudny Industrial Institute, Republic of
Kazakhstan.

Olga Andreeva, Candidate of Economic
Sciences, Associate Professor of the
Department of Finance, Head of the
Center for Strategic Studies of Socio-
Economic Development of the South
of Russia, Rostov State University of
Economics, Russia.

Darkhan Akhmetov, Ph.D., Faculty
of Economics, Department of
Economics and Management, Kostanay
Engineering and Economic University
named after M. Dulatov, Republic of
Kazakhstan.

Ekaterina Gutnova, Master of
Information Systems, programmer at
JSC “SSGPO”, Republic of Kazakhstan.



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution, and
reproduction in any medium, provided
the original work is properly cited.

Conflict of interest statement:
Author(s) reported no conflict of interest

Venera Zarubina (Republic of Kazakhstan), Mikhail Zarubin (Republic of Kazakhstan),
Olga Andreeva (Russia), Darkhan Akhmetov (Republic of Kazakhstan),
Ekaterina Gutnova (Republic of Kazakhstan)

WEB-SERVICE PROMOTION OF SAAS SERVICE FOR MINING DESIGN

Abstract

The market of software for automating the processes of mining enterprises is represented by foreign solutions, which increases the dependence of Kazakhstani enterprises on third-party developers. The marketing strategy for promoting the domestic software product focus on conquering the market segment and increasing competitiveness.

The study aims to develop a marketing strategy for promoting the national cloud service “3D-quarry” as a SaaS, taking into account the modern development of Kazakhstan and the globalization of the world’s economy. When writing the matrix of strategic analysis, an analysis of pricing models was used. The possibility of using various measures to promote the service was assessed. A marketing strategy for promoting software for subsoil use is proposed, including tactics of online and offline marketing. The choice of a pricing model for a SaaS product for specialized universities and small design organizations is substantiated. Within the SaaS framework, a set of indicators for evaluating the effectiveness of a marketing strategy is proposed. A comparative analysis of the payback period of the project when using different tariff plans is carried out. Planning horizon – 3 years, planned market share – 5%, conversion rate – 1%, expected payback period – 4.4 years.

The developed pricing policy allows obtaining competitive advantages in comparison with the main representatives of the software market: in the segment of small design organizations – at the expense of an acceptable price, in the segment of educational institutions – at the expense of the freemium pricing model.

Keywords

marketing strategy, pricing, SaaS, digitalization, subsoil use, promotion channels, 3D-quarry, Kazakhstan

JEL Classification M31, L86

INTRODUCTION

Trends in the modern development of the economy cloud services are showing growth rates of up to 25%. This growth rate is not typical of any other sector of the economy. 90% of all web services have been created in just the last 20 months. The digitalization of society leads to total automation and computerization of tasks (Zarubin et al., 2021). According to the Ministry of National Economy of the Republic of Kazakhstan, the share of innovative products, including digital solutions, to GDP in 2019 was only 1.41% (Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National Statistics, 2021).

Kazakhstan currently has a significant sector of the economy associated with the extraction and processing of minerals. Optimal mine planning is critical for the economic success of mining companies and the country’s economy. The share of mining and quarrying in industrial production in 2020 was 43.6% (Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National Statistics, 2021).

When designing new mining enterprises, the factors of resource costs and the quality of calculations play a decisive role in the formation of the cost, and hence the success and competitiveness of a mining enterprise. Enterprises' access to a fast, low-cost, and locally-focused digital mine design system can significantly improve the efficiency of mining operations (Vagonova et al., 2018).

The importance of such decisions is also emphasized by the main directions of the country's economy, expressed in the state program "Digital Kazakhstan". According to this program, the growth of labor productivity in 2022 in the mining industry and quarrying should be 38.9% (Yurist, 2020).

At the same time, in Kazakhstan, the market of software for automating the processes of mining enterprises is represented by such leading solutions as Surpac, Micromine, Vulcan (Australia), Carlson, Rock Works (the USA), and Mainframe (the Russian Federation). All software products are foreign and expensive, which increases the dependence of Kazakhstani enterprises on third-party developers.

The introduction to the market of the new Kazakhstani digital service "3D-quarry", designed to solve the problems of subsoil users, will provide dividends both at the macro and micro levels. At the same time, the process of withdrawal and promotion is fraught with several difficulties: limited resources, opposition from competitors, etc. Effective foresight and overcoming of these events are possible only through the development of a strategy for bringing a product to the market – a marketing strategy.

Many mechanisms for the development of goods for markets are currently well studied and formalized. However, the emergence of new channels for promoting goods (services), as well as the specifics of these goods (services), leads to the need to search for new solutions to the promotion strategy. This is especially true with the concept of promoting cloud technologies. The promoted digital service "3D-quarry" is considered a special case of cloud solutions – SaaS. For a successful introduction to the market, it is necessary to develop and adapt elements of a marketing strategy.

1. LITERATURE REVIEW

The software market for subsoil users is quite attractive for developers and is represented by more than 1,000 titles of various software products, both small free and large proprietary. Freely distributed systems do not provide the required range of tasks for the enterprise and cannot seriously affect the development of both subsoil users and the market segment (Gu et al., 2010).

Commercial systems are presented in various price niches and solutions. However, as studies have shown, products from no more than the top 10 manufacturers are mainly used. Up to 74% (Burdin, 2015) of them are presented in the form of pirated copies, which have several significant drawbacks: from problems with the law, ending with the lack of more or less adapted versions to their local tasks. At the same time, the interviewed potential subsoil users are interested in the appearance on the market of a product for solving local problems of design and planning of mining operations.

Market research has shown that the dominant software model for this sector is the user acquisition of software licenses or bespoke solutions. Only in recent years, elements of using the ASP and SaaS concepts based on cloud computing have appeared (Zarubin et al., 2019).

Information technologies are characterized by an accelerating pace of development, a high level of innovation, and an increase in the GDP share of most countries. Naturally, as for any complex production, all stages of the life cycle of a software product should be sufficiently formalized by certain models, including business models. Software companies must be able to apply different business models to be successful both in the promotion stages and in the support and development stages of systems (Heredia et al., 2015).

Many different concepts are presented to promote the software market. However, since the mid-2000s, the trend of cloud computing and the SaaS concept has become clear (Kolesov, 2009).

Although the use of these paradigms solves many potential problems for service consumers, it also raises new questions for developers and software vendors.

Software-as-a-service providers are growing rapidly, while the current research literature does not pay enough attention to analyzing their business-critical marketing and sales processes. By increasing the effectiveness of marketing to promote a service, one can also increase the efficiency of a profit-oriented organization (Chari et al., 2014).

The SaaS concept, being the development of the rental model, inherits part of the mechanisms for working with clients. The model of the main factors of marketing and selling software as a service is based on the use of the Internet for marketing communications (Tyrvaainen & Selin, 2011). The use of digital technologies creates new opportunities and nuances for the promotion of SaaS.

As a result of the analysis of publication on marketing strategies for promoting SaaS for other market niches, it was revealed that:

- Hall (2020) researched B2B digital marketing strategy, innovative digital methodologies in critical processes such as lead generation, customer retention, and customer experience personalization.
- Lopez-Lopez and Giusti (2020) compared digital strategies and social media usage across the B2B and B2C industries in Spain. B2B companies are slower to create an overall digital strategy compared to B2C firms. Moreover, B2B companies adopting a digital strategy favor more professional platforms (such as LinkedIn), while B2C companies prefer more socially oriented services (such as Facebook).
- Tak and Park (2018) analyzed the market success of software as a service (SaaS) vendors based on customer growth and financial performance.
- Dempsey and Kelliher (2018) investigated revenue models and pricing strategies in the B2B SaaS market. Customers in B2B SaaS subscribe to a specific service and usually for

a specific period. Thus, the fees they pay for each user are usually a fraction of the traditional perpetual user license fees.

- Brown (2021) reviewed a marketing strategy for SaaS with 12 elements: content marketing, service search engine optimization, contextual advertising, referral marketing, industry awareness, customer selection, pricing, offering free trials and/or freemium models, simplifying registration, improving the usability of the service, offers, and discounts, the use of clear calls to action.

Marketing must ensure continuous and uninterrupted search and attraction of potential customers for their subsequent conversion into real customers. According to Indiani and Fahick (2020), 96% of the surveyed experts in the field of SaaS promotion noted that now their priority tactic is to engage and retain consumers using, first of all, emails and social networks.

However, converting the intent of an online purchase into an actual purchase must be facilitated by the convenience of both purchase transactions and service support. In Marketing 5.0, renowned “Four Pillars of Marketing” advocate Philip Kotler offers an approach to how marketers can use technology to meet customer needs and deliver a service. In the face of digital business transformation and changing customer behavior, he proposes the use of marketing automation (Kotler et al., 2021).

Thus, the purpose of the study is to develop a marketing strategy for promoting the national cloud service “3D-quarry” as a SaaS, taking into account the modern development of Kazakhstan and the globalization of the world’s economy.

2. RESEARCH METHODS

The paper provides a SWOT analysis of competing programs of typical representatives of the studied segment of the software market. Leading specialists of mining enterprises of the Republic of Kazakhstan (SSGPO JSC, Aluminum of Kazakhstan JSC, as well as representatives of higher educational institutions training specialists in the field of mining, IT technologies, and mar-

keting) took part in determining the estimated indicators.

Based on the arithmetic mean, the most significant components are highlighted, allowing focusing on the most important criteria and the development of strategic development alternatives. The main strategic actions of enterprises-representatives of software have been determined, which made it possible to highlight the main factors for improving the cloud service.

To determine the marketing strategy for promoting the “3D-quarry” software product, an analysis of the terms of subscription and price proposals of key representatives of this market segment was carried out. The strategy of differentiation and positioning of the developed software product for specialized universities and small design organizations has been substantiated. Activities have been developed, including offline and online marketing tactics.

The analysis and selection of a pricing model for a SaaS product for specialized universities and small design organizations were carried out. Key performance indicators are proposed for a comprehensive assessment of the effectiveness of a marketing strategy.

3. RESULTS AND DISCUSSION

To identify the market niche and target consumer, the analysis of mining calculations for consumers was carried out. Potentially, these systems can be used by three types of users:

- mining companies and subsoil user enterprises;
- design organizations in the field of design; and
- educational institutions that train specialists in the field of mining, ecology, logistics, transport, and the provision of auxiliary processes. The market of subsoil users of the Republic of Kazakhstan with licenses for the extraction of solid minerals or licenses for the design of mining enterprises is represented by large corporations, medium and small companies. Of

the 2,125 registered companies in 2017, 634 are active. The analysis carried out over the years shows fairly high stability of the number of registered and operating companies (KazData Insider, 2021). The number of operating enterprises engaged in mining of metal ores – 123, mining of coal and lignite – 38, companies in the field of development of stone, clay, and sand quarries – 473.

On the territory of the Republic of Kazakhstan alone, educational institutions that train mining specialists are represented by 11 universities that have the right to teach using educational grants. In addition, the target consumer can be universities that train specialists involved in organizing the work of mining companies: logisticians, ecologists, power engineers, etc.

Thus, the target market of potential consumers of a software product in the Republic of Kazakhstan alone is about 645 operating companies and educational organizations. With the similarity of approaches and technologies for the development of open-pit mines in Kazakhstan and the EAEU countries, the potential market for this region alone can amount to about 5,000 clients (Zarubin & Zarubina, 2019).

To identify threats to the project and opportunities for its development, an analysis of the strengths and weaknesses of competing programs on the market was carried out. The analysis of the strengths and weaknesses of commercial programs is presented in Table 1.

Based on the arithmetic mean for each of the four directions, the most significant components are identified, which allow focusing on the most important criteria and developing strategic development alternatives. Table 2 includes factors with significance above the arithmetic mean for each block.

The main strategic actions of enterprises-representatives of software should be aimed at integration with technological equipment and the ability to work in real time, as well as the development of measures to combat using the exclusion of the possibility of using unpaid software copies.

Table 1. Strengths and weaknesses of competing programs

Characteristics	Significance	Grade	Weighted score in points	Share
Strengths				
Coverage of most of the tasks of any mining enterprise	3	3	9	0.18
Well-developed technical support service	2	3	6	0.12
Well-developed marketing service	3	3	6	0.12
Availability of methodological support of the software used	3	3	9	0.18
Established positive reputation among consumers	4	4	16	0.32
Availability of own high-performance servers	2	2	4	0.08
Total			50	1
Average value				0.16
Weaknesses				
High price	5	5	25	0.34
High requirements for consumer hardware	1	1	1	0.01
The need for the consumer to have its own IT service	4	4	16	0.22
The need for a consumer to have a Data center or servers	4	4	16	0.22
Significant functional redundancy paid for by the consumer	2	2	4	0.05
Closeness of algorithms	3	2	6	0.08
The difficulty, and often the impossibility, of integration with own developments and third-party products	2	3	6	0.08
Total			74	1
Average value				0.14
Threats				
Legal nihilism and consumer use of unpaid (unlicensed) copies of the product	4	4	16	0.48
Lobbying by large “players” of their software product and non-price competition	3	3	9	0.27
LAN attacks and server power outages	3	2	6	0.18
Changes in the legislation in the field of subsoil use	2	1	2	0.06
Total			33	1
Average value				0.25
Opportunities				
Integration with technological equipment and the ability to work in real time	5	5	25	0.49
Attracting highly qualified specialists for the development of systems	4	5	20	0.39
Collaboration with educational institutions	2	3	6	0.12
Total			51	1
Average value				0.33

Table 2. Strategic analysis matrix

Strengths	Specific gravity	Weaknesses	Specific gravity
Coverage of most of the tasks of any mining enterprise	0.18	High price	0.34
Availability of methodological support of the software used	0.18	The need for the consumer to have his own IT service	0.22
Established positive reputation with consumers	0.32	The need for a data center or servers for the consumer	0.22
Threats		Opportunities	
Legal nihilism and consumer use of unpaid (unlicensed) copies of the product	0.48	Integration with process equipment and the ability to work in real time	0.49
Lobbying by major “players” of their software product	0.27	Attracting highly qualified specialists for the development of systems	0.39

All mining software products today offer tools only for reserve estimation, individual design operations, and mine planning. At the same time, such areas as the calculation of ventilation, power supply, and drainage systems are poorly provided with effective computer-aided design systems.

To determine the marketing strategy for promoting the “3D-quarry” software product, an analysis of the terms of subscription, price proposals of key representatives of the developers of this market segment was carried out. Typical representatives of software in the studied market segment are presented in Table 3. Currently, in Kazakhstan, the market of software for automating the processes of mining enterprises is represented by such leading foreign solutions as Surpac (Geovia Surpac, 2021), Micromine (Micromine, 2021), Vulcan (Capterra, 2021), Carlson (Carlson, 2021), RockWorks (Rockware, 2021), and Mainframe (Technology Credo, 2021).

The main market players are represented by such countries as Australia, the USA, and Canada. The market entry of a domestic software product should be attractive at prices for consumers, and also include marketing activities to promote the product both offline and online.

For the successful implementation and further advancement of the system, taking into account the results of the analysis, the main conceptual solutions have been identified:

- concept of providing the system to the end user;
- means of implementation;
- strategy for promoting the system on the market; and
- system commercialization strategy.

It was revealed that a distinctive feature of modern digital systems of subsoil use is the use of only the ASP concept in software development, which imposes certain restrictions on their use and additional difficulties in their “deployment” and support by consumers.

The analysis of trends in the development of the IT market in other areas revealed a gradual abandonment of localized products and a shift to the “clouds” for most IT solutions. Taking into account this and the active development of cloud technologies, a logical conclusion arises about the need to switch to the use of cloud technologies and to manage mining operations. In this regard, a decision was made to implement the “3D-quarry” system as a cloud service built using web application technology.

The proprietary systems of large manufacturers presented on the market are built on the principle of a single application; they have significantly redundant functionality and do not allow the

Table 3. Price proposals of typical representatives of mining design software

Name	Price of software, \$	Annual subscription cost, \$	Additional characteristics	Country of origin
Mainframe boxed products open pit mining 8.0	5,282	135	One can order a temporary version for 2 weeks, GGIS MINEFRAME is included in the Unified Register of Russian programs for computers and databases	the Russian Federation
RockWorks	1,500, single license	The option is available after the registration	Free trial, standard, advanced level 3,000, 5,000 \$	USA
Vulcan	–	424	No free version, free trial	Australia
Carlson	3,950, single license	The option is available after registration	Demo version	USA
Micromine	16,977, double license	The option is available after the registration	Trial license	Australia
Surpac	There is no information in the public domain, price on request	The option is available after registration the	No free version, free trial	Australia

client to select the minimum required configuration for purchase. For the flexibility of the formation of subsystems required by a specific end user, and to reduce his costs for the system, an approach to building a “3D-quarry” system, as a set of connected services (SaaS-solution), is proposed. Accordingly, it is assumed that each end user determines the required list of subsystems.

In the future, if necessary, the user will be able to both pay and connect new additional subsystems and disconnect unused ones. The use of the SaaS cloud computing model makes it possible to reduce the cost of maintaining software on the user’s side by refusing to self-administer the resource, to provide users with ease of use due to the cross-platform nature of the resource and independence from the hardware and software resources used on the client’s side. Thus, from the point of view of the client, classical computers, tablets, and smartphones can be used as equipment.

The software resource required for operation is only a browser included in the basic package of any operating system and an Internet connection. An additional requirement for the implementation of this approach is the implementation of an adaptive interface (for the formats used and the screen resolution of the devices used by the user).

Important factors for the choice of SaaS as a promotion model were the economic parameters and use of the resources of the system owner: the convenience of controlling the monetization of the resource, the convenience of protecting against the use of unauthorized copies in comparison with the concept of Application Service Provider (ASP), and the elaboration of mechanisms for the promotion of the resource as a web-site.

Additional parameters of the strategy are selectable modularity of the application for the end user, and transparency of the methods used for the end user.

The market is in the process of constant transformation, at the moment of economic development there are huge potential opportunities for its growth. The strategy of promoting a cloud ERP system, as one of the most important strategies, also has great potential and can change following changes in the economic environment.

The strategy for promoting the cloud system “3D-quarry” to the market includes:

- strategy of differentiation and positioning;
- PR and advertising strategy;
- product strategy; and
- pricing strategy.

The development of differentiation and positioning strategy is aimed at determining its place in the market and the target group of consumers and forming a list of differences from competitors. As the world and practical experience show, there are only two ways to compete in the market: to be different from others (differentiation) and to be a leader in terms of costs. Moreover, these two strategies – the differentiation strategy and the cost reduction strategy – should exist in parallel and complement each other.

Adhering to a differentiation strategy leads to an increase in competitive advantage and an increase in the efficiency of the organization. It has also been noted that the success of manufacturing organizations is determined by their ability to be flexible in strategic planning and to integrate internal and operational factors in creating a differentiation strategy (Islami et al., 2020).

“3D-quarry” is positioned as a system of intelligent management and digitalization of an open field, where they value their time and their money. When differentiating the “3D-quarry” system, the following differentiation criteria were identified:

- An acceptable subscription price. While maintaining full functionality and high reliability, unlike competitors, the pricing policy is focused on the domestic market and its financial capabilities.
- Functional completeness of the accounting system. The system is initially focused on the domestic market, accordingly, it is built under the current legislation: does not require adaptation, is adequate to changes in the norms and rules of financial and tax reporting.

- Modularity of the system. The system assumes the ability to connect, and therefore pay, only those modules that are needed by the client at the current time.
- Security of customer data. Availability of a reliable and secure centralized backup storage of customer data. Availability of cryptographically protected data transfer protocols and encryption algorithms for client data.
- Geographic independence of the client. The ability of a client (especially a manager) to work in the system from anywhere in the world.
- Cross-platform system for the client. The ability for the client to use gadgets and programs convenient for him to work, and not only computers and regulated operating systems.
- Multilingualism. Ability to work in a language convenient for the client (Kazakh, Russian, or English) with automatic generation of reporting documents in the state or Russian language.
- Prompt customer support. Online customer support center.
- development and promotion of a business card site with information about the “3D-quarry” system and the landing page “3D-quarry”;
- buying contextual and targeted advertising;
- creation of communities in social networks (Odnoklassniki, VKontakte, Facebook) and SMM;
- presentation of the system at business meetings with associations of subsoil users and educational institutions;
- cold sales (outbound telemarketing, distribution of newsletters to small businesses and individual entrepreneurs); and
- advertising in news and business print media.

Attracting visitors to a software or SaaS solution using content that engages them should include the following areas:

- author’s website and other platforms on which software is sold using a Gutenberg diagram describing the most typical pattern of behavior when viewing a page on a monitor, tablet, or smartphone screen;
- third-party content platforms such as blogs, video sites such as YouTube, Vimeo, podcasts, or software review sites;
- search engines such as Google; and
- social media platforms.

To promote the system within the framework of the advertising strategy, it is planned to perform the following actions:

The marketing strategy should include measures to promote the service of both online marketing and offline marketing tactics (Table 4). The developed site must meet the required conversion goals.

The product strategy is aimed at continuous improvement of the software product through the development of new modules. The choice and preference of using various pricing models for a SaaS product for the target audiences under consideration (educational institutions that provide training in educational programs “Mining”, as well as for small project enterprises) are presented in Table 5.

As part of the marketing strategy, at the first stage, the optimal pricing model for educational institutions is supposed to use the Freemium model, followed by the application of tariff plans; for small project enterprises – the use of tariff plans.

A company with limited resources may qualify for one or more specific segments. This strategy limits sales but can be very profitable.

The marketing strategy for the elements of the marketing mix includes:

- continuous improvement of the software product through the development of new modules;

Table 4. Online marketing activities to promote the service

Direction	Characteristic	Possibility of application
Sales quotation automation	Embedding automatic subscriptions and payment forms	Applicable for further development of the service when promoting solution
Changes to the registration process for purchases: two-step authentication	At the first stage, enter the identifier, at the second – the password	At the stage of promoting the core of the system, it is functionally impractical
third party authentication services reducing the number of required fields during registration	Linking through social networks	It is advisable to apply with a limitation of up to three attributes
Freemium business model to attract leads and increase conversions	Using the free version with limited functionality	Applicable for the kernel due to the minimum required implemented functionality
Content marketing	Call booking to receive highly qualified potential customers for software product demonstration	It is impossible in online mode due to the small staff of employees involved
Partner pages to expedite registration of related SaaS partner products	A page on a website that features other related SaaS products that are not directly competitive to promote similarly on its website	Difficult to apply due to limited target audience and SaaS solutions focused on them
Product overview	Demonstration of the product's capabilities on the service	Expedient
Referral marketing to increase website conversions	Sales by referral to customer partners	Expedient
Hosting a SaaS software product on third-party review sites	Buying advertising on third-party resources	Expedient
Business meetings	Webinars, web conferences. Target business audience for more product details	Expedient
Blog	Substantial content, constant updates, discussion platform, use of the Gutenberg diagram	Expedient
Virtual exhibition of software product	Demonstration of software product	Expedient
Online catalog	Accommodation in a business segment with contact information	Expedient
Newsletter	Newsletter by e-mail	Expedient
Artificial intelligence for marketing automation	Advanced analytics, dialogue marketing platforms	At the stage of implementing the kernel, due to the limited time and financial capabilities, it is impractical

Table 5. Choosing a SaaS product pricing model

Pricing model	Educational institutions	Small engineering/mining
Based on usage, fee based on the amount of use, the amount of connection	Not acceptable for universities due to the complexity of the payment mechanism	Little applicable due to the impossibility of entering real data in a small number of sessions
Freemium, the free version with limited features encourages upgrades to paid plans with additional features	Optimal at the stage of system promotion	Due to the rather small demanded functionality of the system, it is economically inexpedient
Tariff fees	Applicable	Applicable
Active user pricing – offers the entire product or feature set, billed per user	Applicable, but due to the need for groups of users to work on the same project, it is difficult to implement management policies	Applicable, but due to the need for groups of users to work on the same project, it is difficult to implement management policies
Price per feature – offers different sets of features at different prices	At the stage of implementing the basic functions of the kernel, it is not very attractive to the client	At the stage of implementing the basic functions of the kernel, it is not very attractive to the client

- increase in sales volume, market share, establishment of flexible prices, tariff plans that are acceptable to the consumer; and
- offline and online methods to promote the service. Within the offline framework, first of

all, it is necessary to focus on personal, or personal, sales – the process of personal presentation of a software product to individual entrepreneurs with a presentation and demonstration of the benefits.

Table 6. Key objectives and performance indicators

Index	Perspective	Target benchmark, per year		
		1 st	2 nd	3 rd
Conversion rate, %	Client perspective	0,5	0,75	1
Share of the domestic (Kazakhstani) market, %	Client perspective	1	3	5
Number of software product exhibitions, including virtual ones, units	Client perspective	10	15	15
Conducting business meetings, including virtual (webinars, web conferences), units	Client perspective	10	15	15
Placement of a SaaS software product on third-party review sites, units	Client perspective	5	10	15
Number of proposed solutions, units	Business processes	2	3	4
Advanced analytics, AI-powered dialogue marketing platforms, units	Business processes	–	1	2
Employee satisfaction index	Personnel training and development	70	80	85

The implementation of the marketing strategy ensures the achievement of key indicators covering various areas of the organizational activities: financial perspective, client perspective, business process perspective, personnel training and development. This approach allows evaluating the effectiveness of the proposed marketing business strategy thoroughly (Kaplan & Norton, 1996) Key performance indicators are presented in Table 6.

The planned market share is 5%. Within the framework of this project, an analysis of the estimated payback period was carried out, with a range of changes in the tariff plan of 40,000–60,000 tenge (1 USD = 425,41 tenge as of September 1, 2021). The price range is selected based on the minimum prices offered by competing firms in the given market. In particular, the Russian manufacturers of boxed products Mainframe open pit mining 8.0 offer a tariff in terms of the national currency – 60,000 tenge.

Tables 7–9 suggest the calculation of the payback period for this project, provided that a 5% market share is reached with a change in the annual tariff plan from 40,000 to 60,000 tenge.

Table 7. Calculation of the payback period of the SaaS-product “3D-quarry” (the cost of an annual subscription is 40,000 tenge)

Index	0 year	1 year	2 year	3 year	4 year	5 year
Capital investments, tenge	–5000000	–	–	–	–	–
Number of potential annual SaaS product subscriptions	0	12	20	30	35	40
Tariff, tenge	40000	40000	40000	40000	40000	40000
Income, tenge	0	480000	800000	1200000	1400000	1600000
Discounted income, tenge	–	436363,6	661157	901577,8	956218,8	993474,1
Net cash flow, tenge	–5000000	–4563636	–3902479	–3000902	–2044683	–1051209

The payback period of the project is determined taking into account discounted cash flows. The discount rate is 10%, the refinancing rate in 2021 in the Republic of Kazakhstan is 9.25%.

Capital investments for the project are 5,000,000 tenge. With the cost of an annual subscription of 40,000 tenge, the payback period of the project within the framework of the five-year plan does not come.

The calculation of the payback period of the project with the cost of an annual subscription of 50,000 tenge is presented in Table 8.

As calculations show, the payback within the framework of the five-year plan does not come. Table 9 shows the calculation of the payback period of the project when using the cost of an annual subscription – 60,000 tenge.

Payback on the project comes in the fifth year. The payback period of the project is 4.4 years. Figure 1 shows the dynamics of net cash flow for different tariff plans.

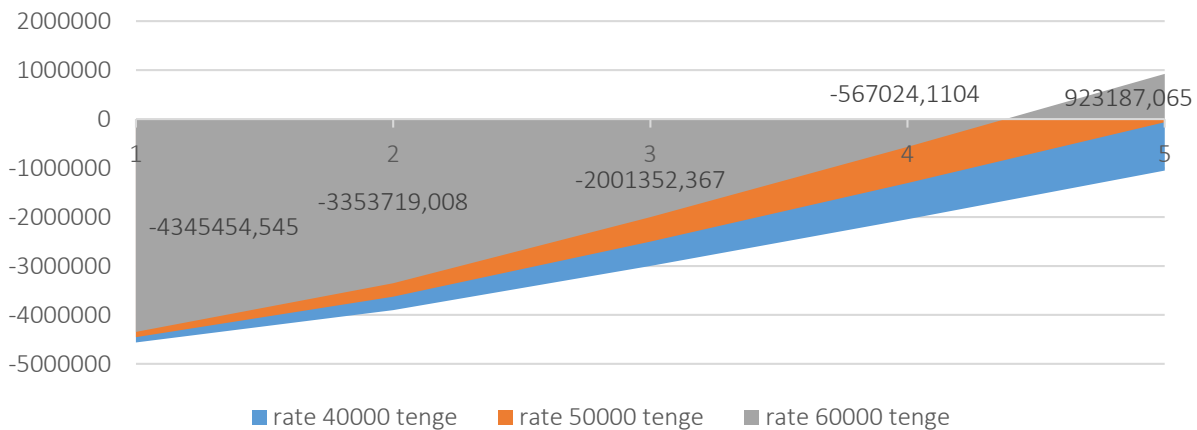


Figure 1. Dynamics of net cash flow for different tariff plans

Table 8. Calculation of the payback period of the SaaS product “3D-quarry” (the cost of an annual subscription is 50,000 tenge)

Index	0 year	1 year	2 year	3 year	4 year	5 year
Capital investments, tenge	-5000000	-	-	-	-	-
Number of potential annual SaaS product subscriptions	0	12	20	30	35	40
Tariff, tenge	50000	50000	50000	50000	50000	50000
Income, tenge	0	600000	1000000	1500000	1750000	2000000
Discounted income, tenge	10	545454,5	826446,3	1126972	1195274	1241843
Net cash flow, tenge	-5000000	-4454545	-3628099	-2501127	-1305853	-64010,8

Table 9. Calculation of the payback period of the SaaS product “3D-quarry” (the cost of an annual subscription is 60,000 tenge)

Index	0 year	1 year	2 year	3 year	4 year	5 year
Capital investments, tenge	-5000000	-	-	-	-	-
Number of potential annual SaaS product subscriptions	0	12	20	30	35	40
Tariff, tenge	60000	60000	60000	60000	60000	60000
Income, tenge	0	720000	1200000	1800000	2100000	2400000
Discounted income, tenge	10	654545,5	991735,5	1352367	1434328	1490211
Net cash flow, tenge	-5000000	-4345455	-3353719	-2001352	-567024	923187,1

Analysis of the payback period of the project with different tariff plans allows concluding the need to use the tariff – 60,000 tenge. In this case, the return on investment will come in the fifth period or in 4.4 years.

Reducing the price when reaching 5% of the market share is impractical, but it is possible

with an increase in the share of the market in question.

A marketing strategy for promoting a software product in the domestic market is visualized by a set of indicators that ensure its achievement. Effective cloud service promotion focuses on maximizing customer satisfaction and improving the software product.

CONCLUSION

As part of the development of a marketing strategy for the promotion of the 3D-quarry web service, the commercial prospects for the development of domestic fourth-generation subsoil use systems as cloud services have been proved. The use of a product strategy to promote the cloud system, the use of online and offline marketing activities for selected market segments – specialized universities and small design

organizations – has been substantiated; the calculations of the optimal tariff plan and the application of the freemium model for educational institutions were carried out.

It is proposed to embed the indicators for evaluating the effectiveness of a marketing strategy into a set of indicators for evaluating a business strategy, taking into account financial, client prospects, business processes, and personnel training and development.

The pricing policy of the leading representatives of software in the field of subsoil use is poorly available for small enterprises in the Republic of Kazakhstan. The lack of available software for the selected segment creates prerequisites for the use of pirated software. The pricing policy of the “3D-quarry” service available to small businesses, especially in the context of the tightening of the fight against piracy in Kazakhstan, makes it possible to gain competitive advantages at the stage of the system’s formation. The use of the service in question in the educational process will allow, in the long term, to create an attractive image of the product for purchase by specialized subsoil users.

As part of further research, it is planned to investigate SMM methods to promote the “3D-quarry” service.

AUTHOR CONTRIBUTIONS

Conceptualization: Venera Zarubina, Mikhail Zarubin.

Formal analysis: Olga Andreeva, Darkhan Akhmetov, Ekaterina Gutnova.

Funding acquisition: Mikhail Zarubin.

Investigation: Olga Andreeva, Darkhan Akhmetov, Ekaterina Gutnova.

Methodology: Venera Zarubina, Mikhail Zarubin, Olga Andreeva.

Project administration: Venera Zarubina, Mikhail Zarubin.

Visualization: Venera Zarubina, Darkhan Akhmetov, Ekaterina Gutnova.

Writing – original draft: Venera Zarubina, Mikhail Zarubin, Olga Andreeva, Darkhan Akhmetov, Ekaterina Gutnova.

Writing – review & editing: Venera Zarubina, Mikhail Zarubin.

ACKNOWLEDGMENT

The study was carried out within the framework of the grant of the Ministry of Education and Science of the Republic of Kazakhstan on the topic IRN AP09561619 “Development of the core of the web service “3D-quarry”.

REFERENCES

1. Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics. (2021). *Statistics of Innovation*. Retrieved August 2, 2021, from <https://stat.gov.kz/official/industry/23/statistic/8>
2. AskUsers. (2016). *Proektirovanieje ekranov sajta po diagramme Gutenberga [Designing site screens according to the Gutenberg diagram]*. (In Russian). Retrieved August 1, 2021, from <https://askusers.ru/blog/pravila/diagramma-gutenberga/>
3. Brown, N. (2021, June 22). *What is SaaS marketing? 12 proven tactics to execute and exactly how to create your own*. AccelerateAgency. Retrieved August 1, 2021, from <https://accelerateagency.ai/saas-marketing-strategy>
4. Burdin, V. B. (2015, March 31). *Kazhstanskij rynek piratskogo softa ocenili v \$136 mln v god [Kazakhstan market of pirated software was estimated at \$ 136 million per year]*. ForbesKz. (In Russian). Retrieved August 2, 2021, from https://m.forbes.kz/process/technologies/rynek_piratskogo_softa_v_rk_otsenili_v_136_mln_v_god
5. Captterra. (2021). *Compare Vulcan with similar products*. Retrieved August 4, 2021, from <https://www.captterra.ae/software/135411/vulcan#pricing>
6. Carlson. (2021). *Purchase Products*. Retrieved August 4, 2021, from <https://account.carlsonsw.com/purchaseproducts>
7. Chari, S., Katsikeas, K. S., Balabanis, G., & Robson, M. J. (2014). Emergent Marketing Strategies and Effectiveness: The Impact of Market Uncertainty and Strategic Feedback Systems. *British Management Journal*, 25(2), 145-165. <https://doi.org/10.1111/j.1467-8551.2012.00843.x>

8. Dempsey, D., & Kelliher, F. (2018). Revenue Models and Pricing Strategies in the B2B SaaS Market. In *Industry Trends in Cloud Computing* (pp. 45-82). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-63994-9_4
9. Geovia Surpac. (2021). *Integrirovanoe Reshenie Dlja Geologii, Modelirovaniya Resursov, Planirovaniya Gornyh Rabot I Upravleniya Dobychej [Integrated solution for geology, resource simulation, mining planning and production management]*. (In Russian). Retrieved August 5, 2021, from <https://www.3ds.com/ru/produkty-i-uslugi/geovia/produkty/surpac>
10. Gu, Q., Lu, C., Guo, J., & Jing, Sh. (2010). Dynamic management system of ore blending in an open pit mine based on GIS/GPS/GPRS. *Mining Science and Technology (China)*, 20(1), 132-137. [https://doi.org/10.1016/S1674-5264\(09\)60174-5](https://doi.org/10.1016/S1674-5264(09)60174-5)
11. Hall, S. (2020). *B2B Digital Marketing Strategy: How to Use New Frameworks and Models to Achieve Growth*. London: Cogan Page.
12. Heredia, A., Colomo-Palacios, R., & de Amescua, A. (2015). Software Business Models from a distribution perspective: A Systematic Mapping Study. *Journal Procedia Computer Science*, 64, 395-402. <https://doi.org/10.1016/j.procs.2015.08.516>
13. Indiani, N. L. P., & Fahik, G. A. (2020). Conversion of online purchase intention into actual purchase: the moderating role of transaction security and convenience. *Business: Theory and Practice*, 21(1), 18-29. <https://doi.org/10.3846/btp.2020.11346>
14. Islami, X., Latkovik, M. T., Draculevski, L., & Popovska, B. M. (2020). Does the differentiation strategy model matter? Determining the effectiveness of an organization using differentiation strategy tools – an empirical analysis. *Journal Business: Theory and Practice*, 21(1), 158-177. <https://doi.org/10.3846/btp.2020.11648>
15. Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, 75-85. Retrieved August 1, 2021, from <https://maaw.info/ArticleSummaries/Art-SumKaplanNorton96.htm>
16. KazData Insider. (2021). *Baza daniy vseh organizacij v Kazahstane [Database of all organizations in Kazakhstan]*. (In Russian). Retrieved August 4, 2021, from <https://kazdata.kz/01/service-organization.html>
17. Kolesov A. (2009, August 31). *SaaS ili ne SaaS. V chem raznica? [SaaS or not SaaS. What is the difference?]*. ItWeek. (In Russian). Retrieved August 1, 2021, from [https://www.itweek.ru/its/article/detail.php?ID=119879%20PC%20Week/RE%20E2%84%9633%20\(687\)%208%20E2%80%93%2014%20D1%81%D0%B5%D0%BD%D1%82%D1%8F%D0%B1%D1%80%D1%8F%202009](https://www.itweek.ru/its/article/detail.php?ID=119879%20PC%20Week/RE%20E2%84%9633%20(687)%208%20E2%80%93%2014%20D1%81%D0%B5%D0%BD%D1%82%D1%8F%D0%B1%D1%80%D1%8F%202009)
18. Kotler, P., Kartajaya, H., & Setiawan, I. (2021). *Marketing 5.0: Technology for Humanity*. Wiley. Retrieved July 25, 2021, from <https://www.wiley.com/en-us/Marketing+5+0+%3A+Technology+for+Humanity-p-9781119668541>
19. Lopez-Lopez, D., & Giusti, G. (2020). Comparing Digital Strategies and Social Media Usage in B2B and B2C Industries in Spain Business to Business Marketing. *Journal of Business-to-Business Marketing*, 27(2), 175-186. <https://doi.org/10.1080/1051712X.2020.1748377>
20. Micromine. (2021). *Kompleksnoe reshenie dlja georazvedki, modelirovaniya i 3D-proektirovaniya gornyhvy rabot [A comprehensive solution for geological exploration, modeling and 3D design of mine workings]*. (In Russian). Retrieved August 1, 2021, from <https://www.micromine.ru/micromine-mining-software>
21. Rockware. (2021). *Rockworks*. Retrieved August 1, 2021, from <https://www.rockware.com/product/rock-works>
22. Tak, O. S., & Park, S. (2018). Investigating SaaS Providers' market success based on the Multivariate LGCM Approach. *Procedia Computer Science*, 139, 227-235. <https://doi.org/10.1016/j.procs.2018.10.255>
23. Technology Credo. (2021). *Stoimost Podpiski [Subscription prices]*. (In Russian). Retrieved August 1, 2021, from <https://credo-dialogue.ru/tseny/value-subscription.html>
24. Tyrvaainen, P., & Selin, J. (2011). How to Sell SaaS: A Model for Main Factors of Marketing and Selling Software-as-a-Service. In B. Regnell, I. van de Weerd, & O. De Troyer (Eds.), *Software Business. ICSOB 2011. Lecture Notes in Business Information Processing*, 80. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-21544-5_2
25. Vagonova, O., Mormul, T., Zakharchenko, Yu., Romaniuk, N., & Kasianenko, L. (2018). Topical problems concerning both methods and economy to develop mineral deposits. *Journal Mining of Mineral Deposits*, 12(4), 82-89. <https://doi.org/10.15407/mining12.04.082>
26. Yurist. (2020). *Postanovlenie Pravitelstva Respubliki Kazahstan ot 12 dekabrya 2017 goda № 827 "Ob utverzhdenii Gosudarstvennoj programmy "Cifrovoj Kazahstan" (s izmenenijami i dopolnenijami po sostojanijuna 01.10.2020) [Decree of the Government of the Republic of Kazakhstan dated December 12, 2017 No. 827 "On approval of the State program "Digital Kazakhstan" (with amendments and additions as of 01.10.2020)]*. (In Russian). Retrieved August 1, 2021, from https://online.zakon.kz/document/?doc_id=37168057
27. Zarubin, M., & Zarubina, V. (2019). Strategiya prodvizheniya oblachnoy sistemy "3D-Karyer" ["3D-quarry" cloud system promotion strategy]. *Aktualnye Voprosy Ekonomiki I Upravleniya – Topical Issues Of Economy And Management*, 44-48. (In Russian). Retrieved September 15, 2021, from <https://www.elibrary.ru/item.asp?id=38508991>
28. Zarubin, M., Zarubina, V., Fionin, E., Salykov, B., & Salykova, O. (2019). Digital system of quarry management as a SAAS solution: Mineral Deposit Module. *Journal Mining of Mineral Deposits*, 13(2), 91-102. <https://doi.org/10.33271/mining13.02.091>
29. Zarubin, M., Zarubina, V., Jambalin, K., Akhmetov, D., Yessenkulova, Zh., & Salimbayeva, R. (2021). Digital Technologies as a Factor in Reducing the Impact of Quarries on the Environment. *Environmental and Climate Technologies*, 25(1), 436-454. <https://doi.org/10.2478/rtuect-2021-0032>