

Saint Petersburg State University
Graduate School of Management

Master of Business Analytics and Big Data

Data-driven Marketing plan improvement: Case of GSOM Master

Programs

Master's Thesis by the 2nd year students

Concentration — BM.5783.2020

Master in Business Analytics and Big Data

Ren Yifei

Yao Xiwen

Research Advisor:

Zhukova Sofia

Professor, Information Technologies in Management Department

Saint Petersburg

2022

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Мы, Жэнь Ифэй, студент 2 курса магистратуры ВМ.5783.2019 «Бизнес-аналитика и большие данные (Master in Business Analytics and Big Data – MiBA)», и Яо Сивэнь, студент 2 курса магистратуры ВМ.5783.2020 «Бизнес-аналитика и большие данные (Master in Business Analytics and Big Data – MiBA)», подтверждаем, что в нашей магистерской диссертации на тему «Улучшение маркетингового плана на основе анализа данных на примере магистерских программ ВШМ», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

Все прямые заимствования из печатных и электронных источников, а также из защищенных ранее курсовых и выпускных квалификационных работ, кандидатских и докторских диссертаций имеют соответствующие ссылки.

Нам известно содержание п. 9.7.1 Правил обучения по основным образовательным программам высшего и среднего профессионального образования в СПбГУ о том, что «ВКР выполняется индивидуально каждым студентом под руководством назначенного ему научного руководителя», и п. 51 Устава федерального государственного бюджетного образовательного учреждения высшего профессионального образования «Санкт-Петербургский государственный университет» о том, что «студент подлежит отчислению из Санкт-Петербургского университета за представление курсовой или выпускной квалификационной работы, выполненной другим лицом (лицами)».

Жэнь Ифэй 31.05.2022

Жэнь Ифэй

Яо Сивэнь 31.05.2022

Яо Сивэнь

STATEMENT ABOUT THE INDEPENDENT CHARACTER OF THE MASTER THESIS

We, Ren Yifei, 2nd year master student of the BM.5783.2020 master program “Master in Business Analytics and Big Data - MiBA”, and Yao Xiwen, 2nd year master student of the BM.5783.2020 master program “Business Analytics and Big Data (Master in Business Analytics and Big Data - MiBA)”, state that our master thesis on the topic “Data-driven Marketing plan improvement: Case of GSOM Master Programs” which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

We are aware that according to paragraph 9.7.1. of Guidelines for instruction in major curriculum programs of higher and secondary professional education at St. Petersburg University «A master thesis must be completed by each of the degree candidates individually under the supervision of his or her advisor», and according to paragraph 51 of Charter of the Federal State Institution of Higher Professional Education Saint-Petersburg State University «a student can be expelled from St. Petersburg University for submitting of the course or graduation qualification work developed by other person (persons)».

Жэнь Ифэй 31.05.2022

ЖЭНЬ ИФЭЙ

Яо Сивэнь 31.05.2022

ЯО СИВЭНЬ

АННОТАЦИЯ

Авторы	Жэнь Ифэй Яо Сивэнь
Название магистерской диссертации	Улучшение маркетингового плана на основе анализа данных на примере магистерских программ ВШМ
Факультет	Высшая школа менеджмента
Направление подготовки	Бизнес-аналитика и большие данные
Год	2022
Научный руководитель	Жукова София Витальевна
Описание цели, задач и основных результатов	Цель данного исследования - разработать рекомендации по изменению маркетингового плана для привлечения иностранных студентов в условиях глобального политического кризиса 2022 года и дать возможность ВШМ достичь целевого показателя набора 30% иностранных студентов на магистерские программы в 2022 году. Для достижения цели исследования было поставлено 8 задач, которые можно свести к двум основным: анализ последствий политического кризиса и выяснение его влияния на маркетинговый план ВШМ; анализ различных источников эмпирических данных и предоставление рекомендаций по изменению

	<p>маркетингового плана ВШМ на основе проанализированных результатов.</p> <p>Результаты данного исследования могут быть использованы в качестве ориентира для российских университетов, маркетинговые планы которых подвержены влиянию кризиса.</p>
<p>Ключевые слова</p>	<p>Политический кризис, маркетинговый план ВШМ, аналитика данных, каналы продвижения.</p>

ABSTRACT

Master Student Names	Ren Yifei Yao Xiwen
Master Thesis Title	Data-driven Marketing plan improvement: Case of GSOM Master Programs
Title Faculty	Graduate School of Management
Main field of study	Business Analytics and Big Data
Year	2022
Academic Advisor's Name	Zhukova Sofia
Description of the goals, tasks and main results	<p>The goal of this research was to develop recommendations on marketing plan changes to enroll international students in the global political crisis 2022 and to enable GSOM to meet the enrollment target of 30% of international students in 2022 for Master programs. In order to reach the research goal 8 tasks are listed for the research, they could be summarized as two main tasks: analyze consequences of political crisis and find out how it influences marketing plan of GSOM; analyze different sources of empirical data, and provide recommendations on GSOM marketing plan changes based on the analyzed results.</p> <p>The results of this study can be used as a reference for Russian universities whose marketing plans are affected by the crisis.</p>
Keywords	Political crisis, GSOM marketing plan, data

	analytics, promoting channels.
--	--------------------------------

Table of content

Introduction	10
Chapter I. Understanding political crisis 2022 influence on marketing activities	11
1.1 Consequences of political crisis: Global, National, Company Level	11
1.2 GSOM as part of SPbU and international environment	13
1.3 Problem statement	13
1.4 Business goal	14
1.5 Research goal and tasks	14
1.6 Summary	15
Chapter II. Research methodology and Empirical Data for marketing plan changes	17
2.1 Methodology for marketing plan Analysis: Traditional marketing methodologies introduction and selection: 4 Ps, 4 Cs, 7 Ps	17
2.2 Research Methodology for business and data understanding: CRISP- DM	20
2.3 Interview	21
2.4 Survey	22
2.5 Metrics for Websites Analysis	23
2.6 Empirical Data	26
2.7 Research framework	28
2.8 Summary	30
Chapter III. Marketing plan analysis and improvement	32
3.1 As Is GSOM marketing plan	32
3.2 Crisis influence on GSOM	36
3.3 Customer Analysis of GSOM site on the basis of log data	37
3.4 Analysis of international body of GSOM SPbU master programs applicants and partners	45
3.5 To Be GSOM marketing plan analysis	49
3.6 Recommendations on marketing plan improvement	51
Conclusion	55
List of references	56

Acknowledgement.....	59
Appendix.....	60

Introduction

Nowadays, it is not only companies and corporations in various industries that spend huge sums of money on marketing in order to offer the best possible deals to their audience, but also in the field of higher education. Universities not only need to meet financial goals on the business side, but also need to attract high-quality and gifted students. This requires the analyzing of which marketing strategies to use, to adjust and improve the strategies with the changes. What's more, at the present point in time of March 2022, due to the complex international political situation, Russia is subject to a series of related sanctions carried out by the United States, the European Union and other countries, regions, and international organizations. This has led directly to a series of related consequences, for instance, very few of current marketing plan activities were fulfilled because of sanctions in 2022. And in terms of international accreditation, the crisis will cause an unclear status of international Triple Crown (EQUIS, AMBA and AACSB) accreditation of Graduate School of Management of St. Petersburg State University (GSOM SPbU) in the nearest future. In other words, can GSOM still use Triple Crown accreditation as a selling point for the next academic year's intake? Further on, we began to think. Which existing marketing activities were really being done before the crisis? Which can be done about it in the nearest perspective?

In this paper, we are dedicated to proposing recommendation for developing marketing strategy for Master programs of GSOM SPbU.

The thesis is consisted of a title page, declaration of independent nature of the work, annotation, table of contents, introduction, three chapters, conclusion, list of reference, acknowledgement and appendices. The study itself consisted of the three main parts that are reflected in the organization of chapters and contents of the thesis. The first chapter introduces the influences on GSOM marketing plan under the political crisis 2022, business goal, research goal and tasks. The second chapter of the study is the broad justification on the choice of methodologies and description of empirical data. In the third chapter, 7 sources of empirical data were analyzed, and the results were synthesized to give recommendations on improvement of GSOM marketing plan.

Chapter I. Understanding political crisis 2022 influence on marketing activities

1.1 Consequences of political crisis: Global, National, Company Level

As a result of Russia's "special military operation" against Ukraine, which began on 24 February 2022, there has been widespread discussion in the international community and 32 countries and regions, led by North Atlantic treaty organization (NATO) and described by the Russian government as "unfriendly", have begun to A series of restrictive measures have been imposed on Russia. As the subject of this paper is the Graduate School of Management of St. Petersburg State University, which is bound to be affected by this series of international events/restrictions in its daily teaching and marketing activities, we have decided to analyze these restrictions at the global, national and university levels in order to understand how these effects occur, and to facilitate our subsequent work:

In global level: As Association to Advance Collegiate Schools of Business (AACSB) declared on their official website "we have collectively decided to suspend all membership and accreditation activities with Russian institutions until further notice" ("AACSB," 2022), Quacquarelli Symonds (QS) also published an official statement called "response to the crisis of Ukraine" on its official website, which mentioned "We are ceasing any new customer engagement in Russia and pausing active engagement with current Russian customers. We are ceasing the promotion of Russian universities or Russia as a study destination" ("QS," 2022). Times Higher Education, another mainstream university ranking list in the world, also released an official statement titled "Ukraine crisis: a message from THE's chief executive" on its official website, which mentioned "We will be ending all business development activity in Russia. This means that we will not be seeking out or taking on any new commercial activity with Russia until further notice. As part of this, we will be taking steps to ensure that Russian universities are not using branding or other promotional opportunities offered by THE until further notice" (Paul, 2022) . Such a statement from three of the world's leading educational accreditation and ranking bodies will undoubtedly have a significant impact on the international reputation of the Graduate

School of Management of St. Petersburg State University, as the GSOM has lost the quality of education in the international mainstream from this perspective. The so-called "triple crown accreditation" has been the primary selling point for GSOM in recent years to attract international students.

In national level: On 28 February 2022, Russia has closed its airspace to airlines from 36 countries, including all 27 EU member states ("Sputnik news, " 2022), in response to an aviation ban imposed on Russia by the West in connection with Russia's "special military operation" against Ukraine, which is obviously a huge problem for GSOM's international students and international professors from countries on the restricted list, and it is reasonable to assume that the number of both international students and international professors will be greatly reduced if the aviation ban is not lifted. On the other hand, according to a report by Sputnik news, the number of active Russian language contributors to YouTube has dropped by 21% since 24 February, TikTok has lost 87% of its Russian language contributors and 93% of its Russian language content, and Instagram has lost 56% of its active Russian language contributors and 55% of its Russian language content ("Sputnik news, " 2022). This will obviously affect GSOM's marketing plans on all three media platforms, the impact of which we will discuss in Chapter 3.

At the university level: Through our interview with GSOM marketing officer Daria Lebedeva, we got that all existing master's double degree programs at GSOM have been suspended, such as the Master in Business Analytics program (MiBA) in collaboration with Lappeenranta-Lahti University of Technology LUT in Finland, the Master in Management program (MIM) with HEC-Paris in France and with LUT, and the Master in Corporate Finance program (MCF) with Kozminski University in Poland. In addition, although the exact number of partner institutions which maintained exchange programs with GSOM before the crisis were unable to obtain, we were fortunate to have the help of Daria Lebedeva, who provided us with a list of institutions that continue to maintain exchange relations with GSOM and were analyzed detailly in Chapter 3 to support subsequent in-depth research.

1.2 GSOM as part of SPbU and international environment

The Graduate School of Management at St Petersburg University is a leading business school in Russia created on the basis of St Petersburg University, the oldest university in Russia and the largest center of science, education and culture. It trains specialists in management, international business at undergraduate, graduate, MBA, Executive MBA and corporate continuing education programs. These areas are developed and taught in cooperation with international business schools and faculties of management and administration of foreign universities.

GSOM is the only Russian business school which is in the top 95 of the best European schools in the Financial Times ranking and holds the prestigious international accreditation of AMBA, EQUIS and AACSB and being one of the top 1% of business schools worldwide to receive such recognition.

According to data published on the official GSOM website (<https://gsom.spbu.ru>), for the master's program, before the crisis GSOM had more than 200 partners worldwide, 89 academic partners, four double degree programs including CEMS, and some 1,500 students had graduated from the program since 2002.

1.3 Problem statement

However, at the current point in time of March 2022, because of the 'special military operation' against Ukraine, Russia is being subjected to a series of related international sanctions by the US, the EU and their allies, which will indirectly or directly affect our research subject GSOM. For example, international accreditation as a measure of quality in higher education (Triple Crown accreditation, QS International Business School Rankings, Times Higher Education International Business School Rankings), although claiming to have stopped working with Russian universities, the authors found that they still publish GSOM-related data in the latest edition of their rankings. This is a point of uncertainty, and we must analyze how GSOM should implement or revise its range of marketing plans with this uncertainty, which is one of the main outputs of this research. In addition, we need to find out which of the current GSOM marketing plans that Daria Lebedeva provided us with are affected by the recent sanctions? Which are not affected by them? Which have been completed? Which could not be completed at

all or to some extent due to the sanctions? With the perspective of the visitors of the GSOM's official website, do we need to adjust our marketing plan and activities accordingly?

1.4 Business goal

This work can be seen as a consultancy project for GSOM SPbU. Due to the sudden change in the international political situation in March 2022, the marketing department of GSOM and the authors agreed to extend the original case selection for all mater programs. After several meetings with Daria A. Lebedeva, head of marketing and GSOM SPbU, we understood that GSOM has been increasing its share of international students in its programs in recent years, so we have set the business goal of this research: Reach the enrollment target of 30% of international students in 2022 for Master programs. With a clear figure of 30% as the indicator for how quickly and clearly higher education practitioners can respond to the current situation in the context of the international political crisis. To maintain GSOM's international presence as much as possible during a series of international sanctions resulting from the international political crisis.

1.5 Research goal and tasks

The research goal was set as: Develop recommendations on urgent marketing plan changes to enroll international students in the global political crisis 2022. In order to expand the academic knowledge base for research on marketing channels relevant to the higher education sector in the context of the political crisis and to address the marketing improvements at GSOM, after several meetings with Daria A. Lebedeva, head of marketing and GSOM SPbU, we discussed the key questions we expected to be answered, the research in this paper focuses on addressing the following questions:

Research question 1: How the political crisis influences marketing plan of GSOM?

Research question 2: What can be done in the situation of the revealed limitations?

We have 8 tasks need to be completed in the process of research. For research Question 1:

Task 1.1: Collect in one place and Analyze consequences of political crisis for GSOM international collaboration in terms of official documents

Task 1.2: Analyze AS- IS GSOM marketing plan

Task 1.3: Analyze the customer change on the basis of GSOM site log data

Task 1.4: Analyze international body of GSOM master programs applicants

Task 1.5: Find out what business schools decide to continue collaborate with GSOM regardless of sanctions

For research Question 2:

Task 2.1: Analyze TO- BE GSOM marketing plan cannot be fulfilled

Task 2.2: Analyze presence of SPbU on Chinese educational advertisement platforms

Task 2.3: Provide recommendations based on the analyzed results

1.6 Summary

Before the international sanctions caused by the "Russian Special Military Operation against Ukraine", GSOM SPbU has the "triple crown" accreditation of AACSB/AMBA/EQUIS, which are the best accreditations in international higher education industry, and for its master's programs, it has nearly 200 partners, 89 academic partners worldwide, 4 double-degree programs and a 50% share of international students, nearly 1,500 students have graduated from GSOM since 2002.

However, due to the uncertainty of international sanctions, the international political environment may change, which may directly or indirectly affect the GSOM enrolment and teaching environment. from this perspective, if the business goal of this project is set as: Reach the enrollment target of 30% of international students in 2022 for Master programs, for GSOM, they will face the following problems:

- Loss of international accreditation as a measure of quality in higher education (Triple Crown accreditation, QS International Business School Rankings, Times Higher Education International Business School Rankings).
- Some international teaching activities were cancelled (international academic lectures, international exchange programs, etc.)
- Foreign teachers are restricted from working with GSOM

- Some marketing activities in the current marketing plan will not be implemented.

For students or potential applicants to GSOM, students from some Western countries are prohibited to enter Russian Federation, and those who have already studied at GSOM will face the possibility that this study experience may not provide the competitiveness that they expect.

Therefore, in order to reduce the impact of the above problems and reach the business goal successful, the research goal is to develop recommendations on urgent marketing plan changes to enroll international students in the global political crisis 2022.

Chapter II. Research methodology and Empirical Data for marketing plan changes

2.1 Methodology for marketing plan Analysis: Traditional marketing methodologies introduction and selection: 4 Ps, 4 Cs, 7 Ps

Since the 1990s, the rapid growth of the global economy and the rapid changes in technology have created an extremely favorable macro environment for change in the marketing field. Academics began to pay attention to the study of the impact of the new economy and new technologies on marketing theory and practice, resulting in many new concepts and theories, such as network marketing, integrated marketing, relationship marketing, green marketing, service marketing, etc. Further enriching and improving the marketing theory system. Educational marketing theory is also developed under such environmental conditions and applied to the educational market.

In the course of the development of marketing in 100 old ages, marketing mix strategies have also evolved and developed. In this section, we will introduce the 4Ps, 4Cs, and 7Cs marketing strategy theories, and select one of them as the methodology of marketing strategy for this study.

4 Ps Marketing strategy theory: 4Ps Marketing strategy theory is one of the most basic and important theories of marketing, proposed by marketing expert Professor McCarthy (1960) in his "Basic Marketing" (McCarthy, 1960). The so-called "4Ps" is made up of the initials Product, Price, Place, Promotion, plus Strategy. 4Ps theory points out that a company's marketing activities should focus on product, price, channel, and promotion Four variables, that is, the enterprise in the analysis of its own strengths and weaknesses, based on full consideration of the external marketing environment, analysis of the enterprise. In other words, based on the analysis of their own strengths and weaknesses, enterprises should fully consider the external marketing environment and analyze the opportunities and challenges they face, so as to determine the 4Ps marketing mix suitable for themselves and achieve the goal of expanding market share. "Good products at good prices + reasonable sales channels + effective promotion = good business benefits" The 4Ps theory provides a complete marketing campaign. The 4Ps theory gives

theoretical guidance on what products to produce, what price to set, where to sell, and how to promote product sales. The 4Ps theory is highly recognized and applied because it could capture the most critical marketing interactions of a company and thus help it achieve its marketing objectives. In today's complex and ever-changing market conditions, no matter what type of business or organization, they all carry out marketing activities directly or indirectly.

4 Cs marketing strategy theory: In 1990, Bob Lauterborn (1990) created what he called "the 4 C's" to replace "the 4 P's" — Consumer needs and wants, Cos, Convenience, Communication (Lauterborn, 1990). He felt the 4 P's encouraged companies to focus more on marketing products than on building a relationship with their customers, so he developed a new set of guidelines. The 4 Cs help companies understand consumers' needs and wants, analyze the costs they are willing to pay, think about how to make it easier, faster and safer for consumers to buy, and strengthen the information and emotional communication with customers, which is a new function of marketing in addition to the 4 Ps. The important ideas of 4c marketing theory include: (1) the goal of enterprises is customer satisfaction, not just the market rate: (2) price is still the most important factor for consumers, so companies should be willing to pay the cost of customer pricing, and must strive to reduce the cost of customer purchases; (3) the convenience of purchase is also the key to the marketing The key to success is to design channels according to the customer's preferred convenience.

7 Ps service marketing strategy theory: Services marketing consist of four dimensions that describe the product (service) as perishable, heterogenic, inseparable and intangible (Zeithaml et al., 1985). A service is perishable since it could not be saved for later use. A service is also heterogenic and therefore hard to standardize which could affect the quality. It is also inseparable since the sender (seller) and the receiver (buyer) are involved in the production of the service. Finally, as services are intangible it could not be stored or patented and therefore difficult to communicate (Zeithaml et al., 1985). Taking these dimensions into consideration within high education institutions, they serve different purposes. Since education is inseparable there is an importance of a mutual understanding between the high education institution and the student. As a branch of services marketing, educational marketing uses tools and instruments that were developed for services markets. One of the most important add-ons is the 7 Ps approach. Except

four Ps (product, price, place, promotion) model which traditionally used in physical products, by adding process, people and physical evidence to the traditional mix, educational institutions can use a complete marketing strategy to address the market situation and to follow objective. All these 7Ps have their special usages and outcome in the marketing mix. Although the framework considers each strategy one at a time, the synergy between each component should be taken into consideration. Each component is able to alter the effect on each other (Ivy, 2008). The conceptual framework has been created in relation to academic needs and wants of a marketing approach that was more education based and linked to how high education institutions attract and enroll students, in comparison to traditional business-based methods (Oplatka, 2009). The theoretical framework is therefore relevant to the study's area of marketing within higher educations.

The practitioners of higher education sector are facing competitive pressures from management and business schools around the world; and as the competitive environment becomes progressively more intense and complex, providers of educational services will have to optimize their educational offerings in an attempt to provide the most attractive educational program to compete for students (potential/target customers). Because of the increasing competition business schools face the importance of having a development strategy. In order to stay in the leading position of all business schools, they must not only set strategic goals and KPIs to adhere to these goals, but also update them based on current situations (Thomas, 2007). Andrew Cripps, founder of the educational research company Carrington Crisp, confirms these views: "The potential market for business schools is vast, but the market for learning and development is evolving rapidly" (Moules, 2019). It is at this point that the introduction of marketing concepts into the higher education sector becomes particularly necessary.

Throughout its history, higher education marketing emerged in the mid-1980s as an offshoot of the health care marketing field (Hayes, 2007), at a time when a number of conferences and symposia sponsored by the American Marketing Association and the Society for Health Care Marketing were gaining popularity and some marketing practitioners realized that they could important linkages and comparisons between the health care and higher education markets, and the concept of higher education marketing began to be introduced and familiarized with.

Kotler (1990) considers that “there are five concepts under which organizations conduct their marketing activity, namely the production concept, the product concept, the selling concept, the marketing concept, and the societal marketing concept. The marketing concept holds that the key to achieving organizational goals consists in determining the needs and wants of target markets and delivering the desired satisfaction more effectively and efficiently than competitors” (Kotler, 1991).

American marketing master Kotler (1995) and Fox (1995) pointed out in their book "Strategic Marketing for Educational Institution" pointed out that educational marketing involves designing institutions to effectively meeting the identified needs and wants and use market price, communication and distribution to inform, motivate and serve the market (Kotler, Fox, 1995). The particularities of marketing in higher education are needed as in most of the countries primary goal of higher educational institutions is not for profit making, and is a social needs, social marketing and marketing of services apply to higher education (Nicolescu & Paun, 2009). Therefore, educational marketing needs to deploy 7 Ps of marketing mix - 4 Ps: Product, Price, Place, Promotion and 3 more components that can be a competitive advantage which includes variables: "people", "physical evidence" and "process". They could be employed in the distribution, but as it assumes a special importance in this area, it is appropriate to give them a place in the marketing mix classic. Educational marketing involves designing educational institutions to effectively meet identified needs. Based on this, this paper will take the 7 Ps service marketing theory as the guide and focus on analyzing GSOM's educational marketing strategy from the 7 Ps perspective.

2.2 Research Methodology for business and data understanding: CRISP- DM

The CRISP-DM (Cross Industry Standard Process for Data Mining) defines a project as a cyclic process, where several iterations can be used to allow final result more tuned towards the business goals. After identifying the goal to achieve (Business Understanding phase), the data needs to be analyzed (Data Understanding) and processed (Data Preparation) (Moro et al., 2011).

The CRISP-DM methodology begins with a business understanding phase, which involves determining business objectives, assessing situation and setting up a project plan. The data

understanding phase consists of two parts: data description and data exploration. Selecting the data, cleaning it, constructing it, integrating it and formatting it make up one of the more critical and important steps in the method, namely the data preparation phase. Regarding the modelling section, it is divided into three parts: selecting the model, building the model and evaluating the model.

For our analysis, we did not build model, but instead chose to use the 7P marketing model exists in the higher education marketing industry for our analysis. About the evaluation section, it consists of evaluation of results, a review of the process, and determine next steps.

Next comes the deployment section, which requires the production of a final report and a review of the entire project.

In other words, the CRISP-DM methodology provides an overview of the project life cycle associated with data mining, which is divided into six phases (as shown in the figure 1) containing the various stages of the project, their respective tasks, and outputs. The order between each phase is not strict but indicates a logical progression between the phases.

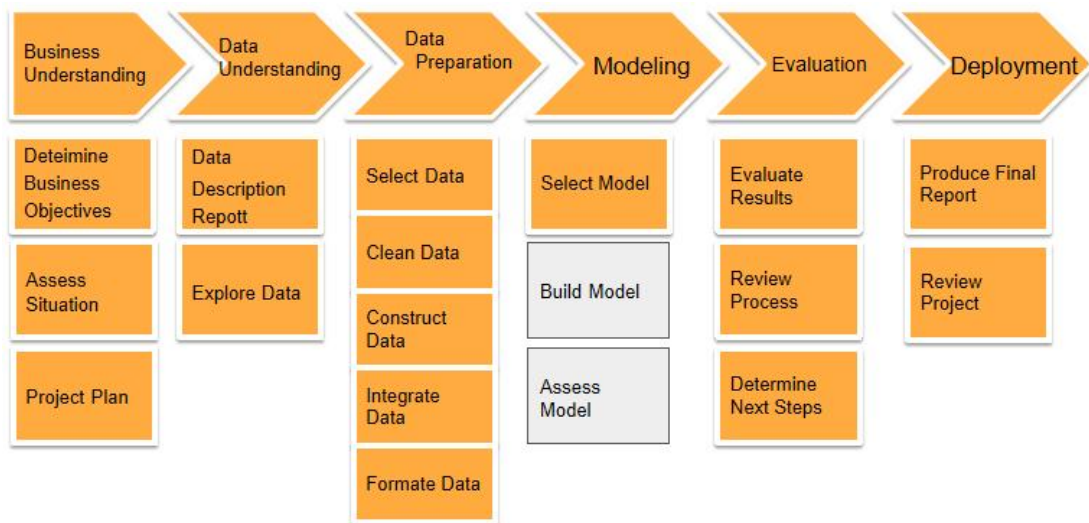


Figure 1. The CRISP-DM process model

Source: [authors work]

2.3 Interview

An interview takes place when a researcher interacts with one or more respondent. The process of an interview could be streamlined if the relationship with the respondent, in terms of

values and expectations improves (Ghauri & Gronhaug, 2020). The personal interview was conducted with one respondent from GSOM. The criteria of the respondent have been based upon working title and position, area of responsibility and knowledge regarding marketing within higher education. The chosen individuals matched these criteria and were therefore compatible towards the study's purpose. A brief description of respective respondent follows underneath.

The first interview took place in 25th of April 2022 with the format of online meeting with the help of Microsoft Teams technology. The respondent - Daria Lebedeva, the head of the marketing department GSOM SPbU, who is responsible for all the advertisements issues as well as brand identity. She is an alumna who graduated from GSOM (2010 – bachelor's program) and SPbU psychology faculty (2012 – master's program). With her academic background and working experience within marketing, expertise in English and friendly approach she was an appropriate interviewee. Regarding the ethical perspective and privacy, the respondents were asked whether her names could be used in the study, and she granted us her permission. To minimize potential misinterpretations and biases we have recorded the video of the interview. The content of the interview is mainly about GSOM's marketing strategy and some changes in strategy and restrictions on some activities since March 2020. There were some questions distributed in the interview that are based on this study's framework with the seven Ps and some questions surround complementary marketing factors for student attraction and enrollment.

2.4 Survey

To answer research question 2 “What can be done in the situation of the revealed limitations”, In addition to analyzing GSOM's current marketing plans, we decided to survey the presence of GSOM (at the faculty level) or SPbU (at the university level) in the Chinese higher education market from the perspective of Chinese students by distributing a questionnaire to Chinese students and alumnus of GSOM and SPbU.

Survey research is defined as the process of conducting a study using a survey sent by the researcher to the respondents. The data collected from the survey is then statistically analyzed to draw meaningful research conclusions. When the researcher measures the concept as a

quantitative research method, i.e., a survey, this can provide possible explanations for the research subject (Bryman & Bell, 2011). Sample is a component of the survey that deals with the segmentation of the population selected for a specific purpose. The method can be based on two approaches, probability, or non-probability (Christensen et al., 2010). In our survey we have chosen the non-probability sample method, since the respondents was restricted to Chinese students who are (and have been) studying at St. Petersburg State University. The language of the questionnaire was set to Chinese to facilitate responses from Chinese students in both the Russian and English programs, all questions and options were translated into English. This link was sent by the author to Chinese students known to be or to have been studying at St. Petersburg State University. In the meanwhile, the office of GSOM helped the author to send this questionnaire to Chinese students who had studied at GSOM. Our survey has a simple design, consisted of 3 questions (see Appendix 11 and 12). The first question was asked to find out which channel generated interest in those Chinese students who had successfully applied to SPbU. The second question was designed to investigate whether the Chinese platform had ever been placed with GSOM (or SPbU) promotional materials or conducted related marketing activities, no matter these materials were placed officially by the university or by a third-party agency. With the feedback from this question, the authors wanted to determine whether the choice to run marketing campaigns (e.g., advertisements) on Chinese platforms was effective, and which channels were more efficient. The third question was designed to determine if SPbU's study programs meet the expectations of Chinese students, which will help determine the potential of the Chinese market for SPbU. When using surveys, sampling error may be appeared when generalizing to a small number of respondents. There are other errors associated with the use of surveys (Bryman & Bell, 2011).

2.5 Metrics for Websites Analysis

Web analytics are metrics that measure the behavior of visitors to a website. Through collecting various Web analytics metrics, KPIs can be developed that measure multiple metrics against each other to define visitor trends (Bernard, 2009). KPIs use these dynamic numbers to provide insight into visitor behavior on a website.

To understand the benefits of web analysis, first need to comprehend the metrics - the different categories of available user information. Some examples of metric types could be found within these categories:

1. Site Usage:

- Numbers of visitors and sessions
- How many people repeatedly visit the site
- Geographic information
- Search Engine Activity

2. Referrers:

- Which websites are sending visitors to the site
- The search terms people used to find the site
- How many people place bookmarks to the site

3. Site Content Analysis:

- Top entry pages
- Most popular pages
- Top pages for single page view sessions
- Top exit pages
- Top paths through the site
- Effectiveness of key content

4. Quality Assurance:

- Broken pages or server errors
- Visitor response to errors (Jackson, 2007)

Each metric is discussed below.

Visitor Type: This metric has evolved from counting the number of hits a page receives to counting the number of individuals who visit the site (Bernard, 2009). There are 2 kinds of visitors: visitor who have visited the website before and visitors who haven't. In order to track visitors, the system must have ability to identify individual users who visit the site; each individual visitor is called a unique visitor. Ideally, a unique visitor is just one visitor, but not

always be the like this way. Multiple users may visit the website from the same device, such as a shared PC or public library (Bernard, 2009).

Visit Length: Known as Visit Duration or Average Time on Site (ATOS), Visit Duration is the total of the time a visitor spends to visit a website during a session (Bernard, 2009). When analyzing the visit length, the measurements are often broken down into chunks of time. StatCounter, for example, uses the following time categories:

- Less than 5s
- 5s - 30s
- 3s - 5 mins
- 5mins - 20 mins
- 20 mins - 1h
- More than 1h (Jackson, 2007)

The goal of this metric is to keep the rate of visitors who stay on a site for less than 5s as low as possible. By combining this data with the data of referral sources and keyword analysis, one can know which paged are referencing targeted traffic and which are referencing low traffic (Burby & Brown, 2007).

Demographic: It shows the locations of the systems used to make page requests. This data may be useful for sites that provide region-specific services (Bernard, 2009). System statistics may include information such as browser type, screen resolution, and operating system which used by visitors to visit the website. It is important that the site is accessible to all customers and that by using this information, the website can be customized to meet the technical needs of visitors.

Visitor Path: A visitor path is the route a visitor uses to navigate a website. Each visitor creates a path of page views and actions when go through the site. By analyzing these paths, we can determine each difficulty a user encounters when viewing a specific part of this site or completing a specific action (Bernard, 2009). By the study of Web Analytics Association, the only page that influences visitor behavior on a Web site is the one they are viewing at that moment, and it is simple to check path data in context without having to reference the entire site in order to study the behavior of the visitors (Web Analytics Association, n. d.).

Top Pages: There are 3 types of top pages, top entry pages, top exit pages, and most popular pages. Top entry pages is a page that a visitor views makes the most profound impression about the website. By analyzing the top entry page, we could be sure that page contains relevant information and provides sufficient navigation of the key parts of the website. Furthermore, through popular exit pages makes it simpler to point out where on the website has confusion or missing content. The most popular pages are the pages that get the highest traffic. By this metric we could know and identify how visitors are using the website, and which pages are providing the most useful content. This metric helps to identify if the functionality of the website meets its business goals (Jackson, 2007).

Referrers Analysis: A referral page is the page that has directed traffic to the website before entering, such as the search engine result page links, a social media page entry mentioning the website, and a personal bookmark. It is important for the website because this metric can be used to examine the effectiveness of the advertising and the popularity of the search engine (Marshall, n. d.).

2.6 Empirical Data

The analysis of the empirical data allows us to find the main directions of marketing plan improvement. To develop data-driven solution to improve marketing plan, in order to attract international students, 7 sources of data were analyzed,

The research data “Log data form GSOM website” was thankfully provided by Vasiliy Garshin. It is tracked by Yandex.Metrica and stored in Clickhouse database. Yandex.Metrica is a web analytics tool that can record of user actions, and track traffic source, The source provides 2 tables “hits” and “visits”, hits consist of events that were made by customers on the website, visits are grouped hits (events) which are used by counting websites visits. The visits table was chosen for analysis as the research was more concerned with the metrics related to the number of visits to the website, it has more than 450,000 rows and 130 parameters.

In order to determine the actual percentage of foreign students from countries that have stable relations with Russia and are not affected by the current international political situation, the list of applicants and acceptances from the official website of St. Petersburg State University in

recent years was obtained (we have collected the years 2018,2019 and 2020, as the university regulations no longer show details of acceptances such as name and nationality from 2021),this dataset has approximately 27,000 rows and 7 columns, we use excel to analyze it.

For determining which international partners are still maintaining international exchange programs with GSOM in the current international political situation, we analyzed the "List of exchange programs universities" provided by the marketing department, which is an excel file with 23 rows and 7 columns.

When comes to marketing strategies, improvement is impossible to be done without understanding and analyzing existing marketing plans, so we had some weekly in-depth interviews/meeting with Daria Lebedeva, head of marketing and GSOM SPbU, have received the detailed information and relevant documents of marketing department, meetings were taking place in Microsoft Teams and Telegram.

About the current marketing plan of GSOM, it is a 77kb excel file which contains 7 sheets: Sheet1: In this tab, basic information is written before the admissions action begins, including organizational objectives, marketing objectives, financial objectives, and the applicant's profile. Sheet 2: this table describes the main elements used by GSOM SPbU to communicate at a strategic level. Sheet 3: lists all types of marketing activities, divided into functional areas, with detailed descriptions. Sheet 4: in which a timeline of activities to be completed during the academic year is listed and may be adjusted during the academic year. Sheet 5: This tab contains the digital campaign planning tool that is needed to calculate and select advertising channels and maintain target budgets. Sheet 6, Results: here the intermediate results are summarized in relation to the funnel objectives. Sheet 7: where important links are shared.

The dashboard was gratefully shared by Daria Lebedeva, it provides visualization and insights into user traffic sources, user actions and other relevant metrics.

The survey was accomplished by the authors, the samples are 54 Chinese SPbU master students and alumnus from 2018-2022 years.

Table 1. Dataset description

Dataset	Data Source	Data Description	IT tools
---------	-------------	------------------	----------

Log data form GSOM site	GSOM	More than 450,000 rows and 130 parameters	Python/Clickhouse database
List of applicants and enrollee of GSOM	SPbU official website	About 27,000 rows and 7 columns	Excel
List of exchanging program universities	Marketing department of GSOM	23 rows and 7 columns	Excel
Current marketing plan of GSOM	Marketing department of GSOM	77kb excel file, contains specific marketing details (selling points/marketing channels/marketing activities and budgets)	Excel
In-depth interviews with marketing staff	Marketing department of GSOM	By weekly meetings with Daria Lebedeva, receive the detailed information and relevant files of marketing department	Microsoft Teams, Telegram
Dashboard	Marketing department of GSOM	9. real-time updated dashboards	Yandex Metrica
Survey	Accomplished by authors	54 samples	"Wen Juan Xing" questionnaire maker

Source: [authors work]

2.7 Research framework

The research framework was used to implement the steps to be taken throughout the research process. It is usually used as a guide for researchers so that they can focus more on the scope of their study (Fazeldehkordi et al, 2014). Table 2 shows the operational framework that will be

followed in this study.

Our research framework was built based on two research question and there are three parts of the research, theoretical background, empirical data and expected results, all of the parts serve to achieve the research goal. The theoretical background consists of two parts, the political issues and the marketing plan change which give the explanation on why and how the high education industry and the influences in the aspect of GSOM’s marketing plan by the crisis, it is of use to define the current problem. In the section of processing the empirical data, we have listed total 8 tasks for the two research questions, task 1.1 to task 1.5 serve research question 1 and task 2.1 to task 2.3 serve research question 2, we follow each tasks to get the expected result.

Table 2. Research Framework

	Research Question 1	Research Question 2	Research Goal:
Theoretic al backgrou nd	<p>Political issues</p> <p>Marketing plan changes</p>		Develop recommendations on urgent marketing plan changes in the global political crisis
Empirical data	<p>Task 1.1: analyze current marketing plan</p> <p>Task 1.2: Collect in one place and Analyze consequences of political crisis for GSOM international collaboration in terms of official documents</p> <p>Task 1.3: Analyze the customer change on the basis of GSOM site log data</p> <p>Task 1.4: Analyze international body of GSOM master programs applicants</p> <p>Task 1.5: Find out what business schools decide to continue collaborate</p>	<p>Task 2.1: Analyze what part of current GSOM marketing plan can not be fulfilled</p> <p>Task 2.2: Analyze presence of SPbU on Chinese educational advertisement platforms</p> <p>Task 2.3: Provide recommendations based on the analyzed results</p>	

	with GSOM regardless of sanctions Task 2.1: Analyze what part of current GSOM marketing plan can not be fulfilled		
Expected results	1.1: Distribution of traffic among countries, period of time, sources, devices. 1.2: Distribution of international students. 1.3: list of countries from where we can expect the applicants. 1.4: Overall list of enrollment limitations because of crisis	2.1: status of marketing activities after crisis + classification of each marketing activities based on marketing framework. 2.2: recommendations	

Source: [authors work]

2.8 Summary

In this chapter, the detailed description of the research methodologies and the empirical data were introduced...

The 7 Ps marketing framework was chosen as our marketing strategies analyzing methodology, since the characteristics of the subject of this project, the 4 Cs and 4 Ps framework are not as applicable as 7 Ps in the project.

With regard to the research methodology, the CRISP-DM methodology was chosen for business and data understanding, in order to facilitate the start of the business understanding phase, identifying business objectives, assessing the situation and developing a project proposal. Overall, we chose to use the CRISP-DM methodology for the entire process of business understanding and to collect, process and analyse data based on these understandings. Interview and survey were taken place for data collection.

For the web analytics section, in order to maximize insight into visitor behavior on the site,

we chose to reproduce and analyze visitor browsing behavior including, but not limited to the following metrics: Traffic Source, Referral Source, Operating System, type of Mobile phone, Hourly/Daily/Weekly UV, Page Dwell Time, Page Load Time, Click-Through-Rate, Number of Page Views, Source of Visit, etc.

Chapter III. Marketing plan analysis and improvement

3.1 As Is GSOM marketing plan

In the marketing plan, there are total 96 activities, they are categorized by ‘online communication, ‘advertisement, ‘customer experience and ‘PR’. After categorizing the activates based on the 7 Ps framework, only 5 Ps are identified and emerging in GSOM’s current marketing activities, they are: Product, Promotion, People, Place, Process (see Figure 2).

Marketing activities	As-Is number of activities before crisis	PROMOTION	PROCESS	PRODUCT	PEOPLE	PLACE
ONLINE COMMUNICATION	25	12	11	7	5	0
Website	7	-	4	3	2	-
Landing	4	-	3	1	1	-
SMM	10	9	1	3	2	-
Email-marketing	4	3	3	-	0	-
ADVERTISEMENT	25	19	13	3	0	1
WEB	5	4	1	1	-	-
Newsletters and banner ads	10	5	5	2	-	-
BTL	10	10	7	-	-	1
CUSTOMER EXPERIENCE	20	11	3	4	1	5
Applicants	3	3	3	-	-	-
Students	6	2	-	3	-	2
Graduates	4	2	-	1	-	1
Ways to increase loyalty	5	2	-	-	1	2
Corporate identity	2	2	-	-	-	-
PR	26	16	0	6	2	3
Media / Materials	9	7	-	2	1	-
Networking and exchange of experience with professional communities	4	4	-	-	-	-
Partnerships and joint activities	10	3	-	3	1	3
Internal events	2	1	-	1	-	-
External events	1	1	-	-	-	-
TOTAL	96	58	27	29	8	9

Figure 2. Marketing activities by 7 Ps marketing framework

Source: [authors work]

Based on the status comments of each activates which were provided by the marketing department of GSOM, that 48% of activities can’t be fulfilled because of the crisis (see Figure 3).

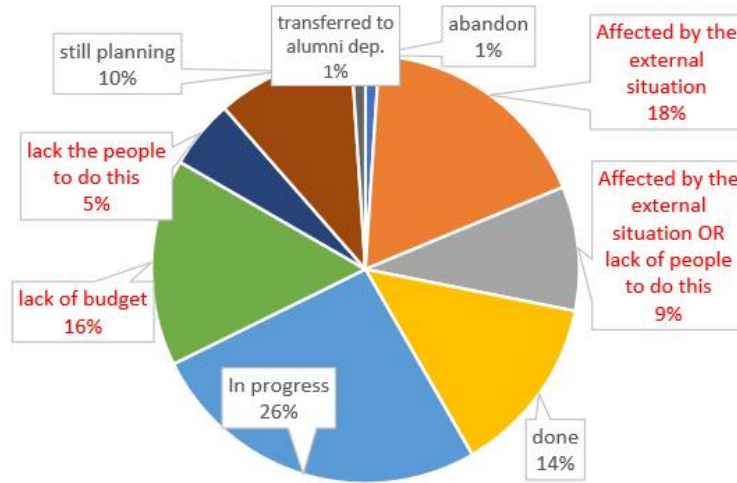


Figure 3. Marketing activities by 7 Ps marketing framework

Source: [authors work]

Product, promotion and process account for the highest proportion (see Figure 4), therefore we will mainly introduce these three marketing strategies.

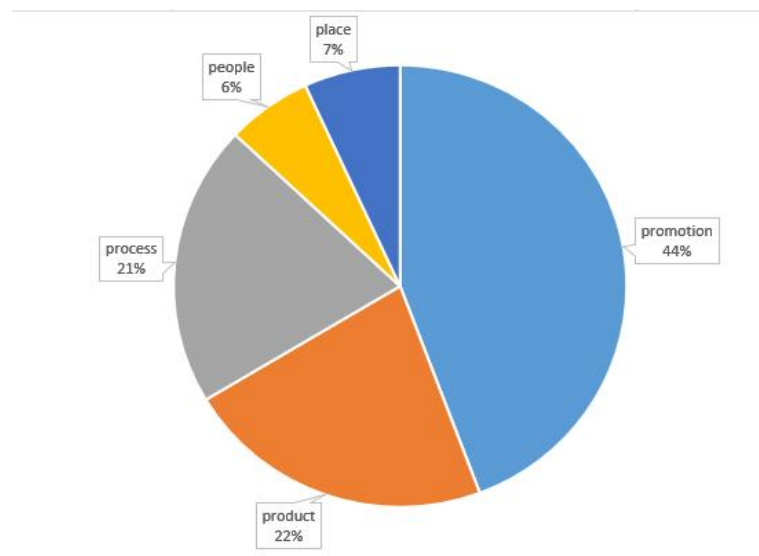


Figure 4. The proportion of each 'P' in GSOM marketing activities

Source: [authors work]

Product: In traditional marketing the product plays a core role in the marketing mix. As we have mentioned before, each component is able to alter the effect on one another, in educational marketing the role of product strategy is not reduced, it can be improved by other components of

the marketing strategy. All the features of the educational product are the same with a service: intangibility, inseparability, variability, perishability (Ivy, 2008). The component physical evidence and people can improve the effect of product, because educational marketing deals with an intangible product the marketing mix will emphasize the physical evidence as a solution to the lack of form, meanwhile the product strategy will rely on the people strategy as long as the people are the ones that create and use the educational service (Ivy, 2008).

In educational marketing, students can be customers or as a product delivered to the labor market. In the former case, the university's product strategy is to focus on the needs of students, and to get more students, not using strict enrollment selection, nor focusing on labor market needs and preferences, universities require students only to obtain a diploma. This single product marketing strategy is often used by college at the rock bottom. In the latter case, taking the labor market as the customer, it pays less attention to the needs of students and more to the skills and career development of students. This kind of educational product will have a strong connection with the latest industry advances and with companies from that field of study. The above two product strategies should be balanced, by creating a program that pay attention on not only the student needs, but also the labor market needs the university will be able to increase the students' and companies' satisfaction (Ivy, 2008).

In the GSOM case, it has well balanced two opinions. The enrollment selection has been adjusted in a proper level, especially for international students and paid students. Meanwhile, GSOM is also very focused on the development and changes of various industries and the needs of the labor market, The educational programs and courses are adjusted annually according to market needs and changes. For example, in the 2021 academic year, through market research and analysis, GSOM introduced Managing a Smart City program (MSC), while canceling the Master in Urban Management and Development program (MUMD). What's more, in GSOM's marketing strategy, the technical skills development and career planning for students in various programs are highly emphasized, for example, for MiBA students, the school provides students in courses with the following skills and requires students to master: Development and implementation of machine learning models, working with big data and its visualization, Management skills, Data governance, enterprise data modeling based on data analysis, etc. For career planning, MiBA

students will be able to apply in the following professions after graduation: Project / Product Manager in Big Data, Advanced Analytics and Data Science, Business Consulting, Chief Data Officer, Chief Innovation Officer, Chief Product Officer.

Promotion: In education marketing, the purpose of promotion strategy is to find an effective way to reach target customers (students), and secondly to improve the reputation and influence of the university.

The first challenge of the university is to fully demonstrate and introduce the educational programs (product) to potential students (customers). At this stage, the most effective channel is the university's official website, it is able to inform and to direct the applicants and candidate to the next step, it is a useful tool for a well-done enrolling process (Ivy, 2008).

The official website of GSOM fully introduces the basic information of the school and the course details and application process of each educational program.

The second challenge is to communicate in an efficient manner its demands and opportunities. As mentioned before a good approach can be an internet portal (Ivy ,2008). GSOM has an official website on many social platforms such as telegram, VK, Facebook, Instagram, etc. Through these platforms, the school can interact with students or potential students, and obtain profile of potential customers by analyzing the page data. a relevant information portal can become a valuable asset for universities. Besides a website that informs prospective students, Ivy (2008) states open days and exhibitions to be important channels for high education institutions. E-mail and advertising could also function as efficient tools for universities in order to inform and stimulate potential students for enrollment (Ivy ,2008). Former students could aid the university in providing constructive experience towards prospective students. They could thereby inform and encourage potential students to enroll, based on previous successes as a graduate from that particular high education institutions (Enache, 2011). GSOM have made related plan of this strategic activities, such as attracting outgoing students to distribute materials about GSOM in partner universities (presentation - distribution of materials), but due to internal and external situations, these actives have been postponed.

Process: Strategy is responsible for a smooth service delivery (Ivy, 2008). In educational services, process strategies can reduce dissatisfaction among all stakeholders, such as students,

administrators, faculty, school leaders, etc. The stage where the process strategy best reflects its value is the enrolment process which transforms applicants into students. The combination of process strategies and people and physical evidence strategies can attract more applicants and improve the university's image.

During the enrollment process, universities are under an obligation to manage students' registration on the right course, accurately calculate of grades and that a correct degree is awarded. Students' satisfaction could also be ensured by supporting accommodation, course schedules and access to the library (Ivy, 2008).

A successful enrollment process will bring the positive effect to the knowledge transferred process, it will affect the quality of the educational products (because is inseparable and variable) and the results of the universities: lower dropout rate, faster labour market integration (Ivy,2008).

In summary, in view of the fact that the GSOM marketing plan emphasizes on these three marketing strategies, but due to the current international political environment, short-term improvement from a product perspective is not an effective strategy. This is because for example working with more international professors to improve the quality of the curriculum or developing academic exchange activities with more international partners cannot be fulfilled and there are no substitutions of these kind of plan in the context of the revealed limitations. Therefore, when proposing recommendations on GSOM marketing plan, we chose to make improvements in the areas of process and promotion.

3.2 Crisis influence on GSOM

Through numerous communications with the marketing staff of the master programs, we understood the objectives and needs of the project from a business perspective. The business industry is higher education industry, and the business goal is to reach the enrollment target of 16 publicly funded students and a minimum of 15 self-funded students from June to August 2022 for master programs.

As a result of the changing international political situation since February 2022, a number of sanctions have been imposed on Russia by the US, the EU and other international, regional and international organizations, which, following our analysis, may have the following implications

for GSOM in achieving its business objectives. In this business process, the major problems are:

1. International crisis February 2022 freezes exchange programs because of sanctions.
2. From 2021 SPbU gives no authority to the faculties to take part in the enrollment of foreign students.
3. The nearest future status of international Triple Crown (EQUIS, AMBA and AACSB) accreditation of GSOM is not clear.
4. Significant increase in costs (Because the change of currency).
5. Mainstream Business School Rankings prohibit Russian universities.
6. Applicants from Western countries are prohibited to enter Russia Federation.

3.3 Customer Analysis of GSOM site on the basis of log data

Nowadays, university websites are an important tool in the information-gathering stage of students' decision-making process. Potential students' first impressions are influenced by the Internet. To make an analogy, a university's official website is like a person's face, and a university without a website is like a person wearing a mask, nobody would like to know a person with an unclear appearance. A university's website is very important because visiting a website first to be found is a precursor to visiting a campus. A university's website presents endless opportunities allowing institutions to produce personalized landing pages while still maintaining overall brand coherence. Separate homepages can be created for different user groups and personas, for instance applicants, international visitors, freshers, etc. Likewise, for the university, the official website of the university is an important intangible asset. University's official website is the ultimate destination of all the marketing efforts for higher educational institutions. Irrespective of the fact whether the universities have opted for pay per click marketing, SEO, social media marketing, influencers marketing, etc. The marketing staffs of university would certainly check visits data of the website for validation. It is precisely the situation where the importance of a website lies since it is the key to all marketing efforts. Meanwhile, the university also could analyze the user's portrait by the data from the official site.

This section mainly analyzes the log data of GSOM's official website, so as to improve GSOM's marketing strategy from the perspective of web page analysis.

We were provided by GSOM a dataset which collects logs from GSOM site and stored in ClickHouse (ClickHouse is a fast open-source OLAP database management system. It is column-oriented and allows to generate analytical reports using SQL queries in real-time) and it is available in read-only format for us to use in our tasks.

The log data was processed in Jupyter Notebook. After accessing the data, we get two tables of data: 'visits' and 'hits', in our task, we only deal with the 'visits' data. We load and explore visits data, get 480,337 rows, 131 columns of data volume. Deal with missing data: delete all empty columns, calculate the proportion of missing values, delete columns with large proportions, reduce 131 columns to 84 columns, and time sort ascending.

According to the Referrers metric of web analysis (Which websites are sending visitors to the site), to analyze our traffic sources. Import the 'LastTrafficSource', 'LastReferralSource' parameters and group by PV and do data visualization.

The 'organic' (see Figure 5) means traffic which comes from search engine, 'direct' means from direct search by 'GSOM' index, 'internal' stands for traffic which form directly entering the GSOM website URL. The most traffic of the site is from search engines and direct search and about 3% from social media such as VK and Facebook. Meanwhile there is a threat to lose 44.7% of our audience on the side of Google leaves Russia (see Figure 6).

Because of the sanction, the marketing of social media channels Facebook and Instagram are prohibited, and Google search engine is an uncertain factor, by the marketing activates plan of GSOM that VK and Telegram are still available. Thus, the university should pay more attention on Yandex search engine and VK or Telegram promoting channels instead of Google, Facebook and Instagram.

Traffic Source

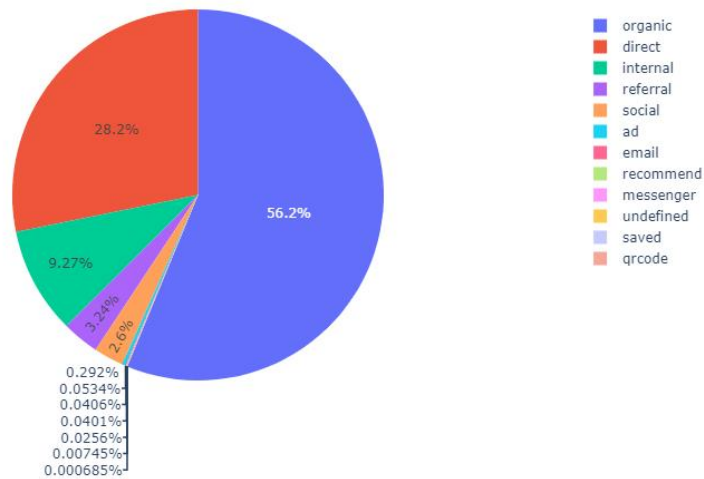


Figure 5. Traffic Source

Source: [authors work]

LastReferralSource

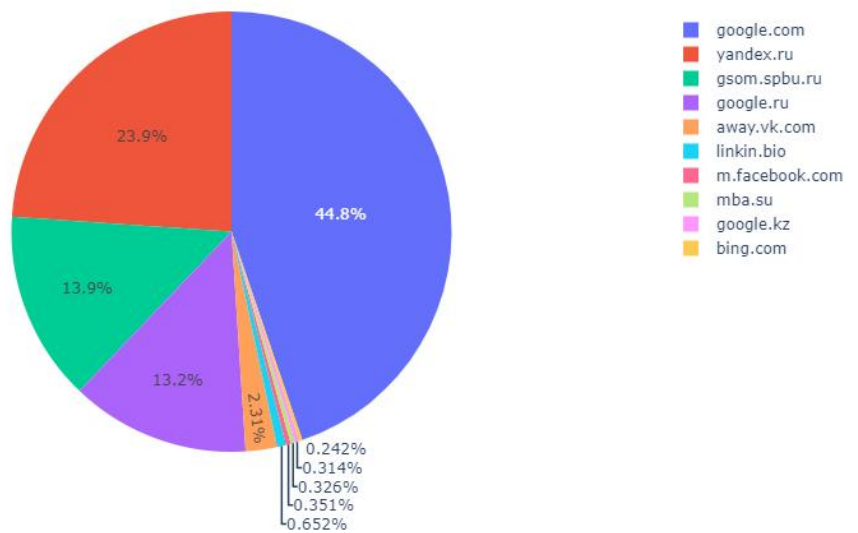


Figure 6. Last Referral Source

Source: [authors work]

Next, the UV was analyzed by time. First, convert and inset Time Filed (convert to datetime format, insert date seg.dim, then define a function for multi-dim. We get Monthly UV, Weekly UV, Daily UV and Hourly UV and visualized these data. From the Monthly UV (see Figure 7), there are two peaks, beginning of July and Sep, the weekly and hourly UV (see Figure 8 and

Figure 10) shows that the period which get the most traffic is 15 o'clock from Monday to Friday. Thus, the university could change the time of promoting events or introduction meetings and online presentations to the highest traffic period (e.g.15 o'clock, Monday, beginning of July), and post it on the website for the potential customers to participate.

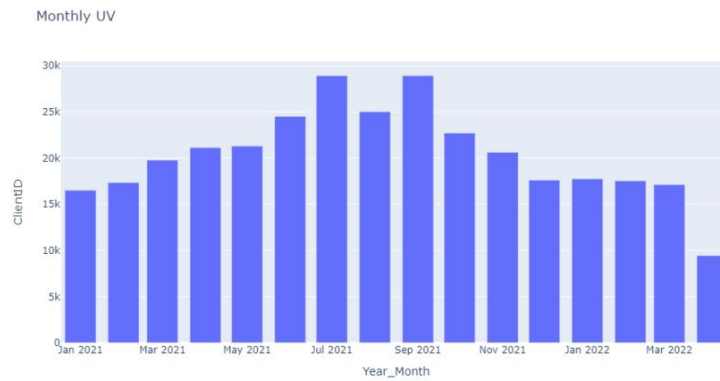


Figure 7. Monthly UV

Source: [authors work]

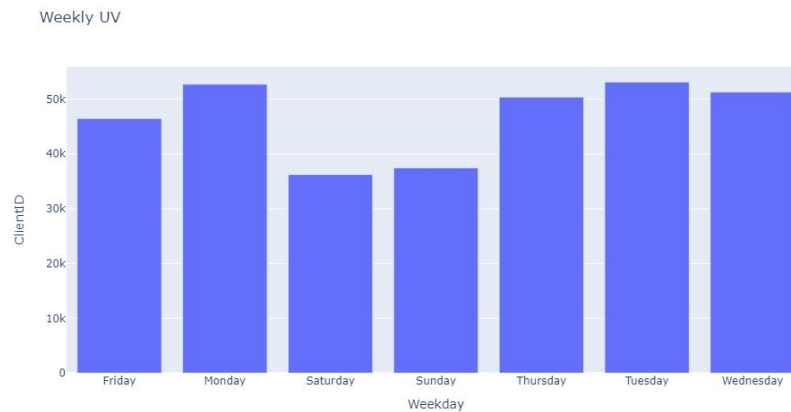


Figure 8. Weekly UV

Source: [authors work]

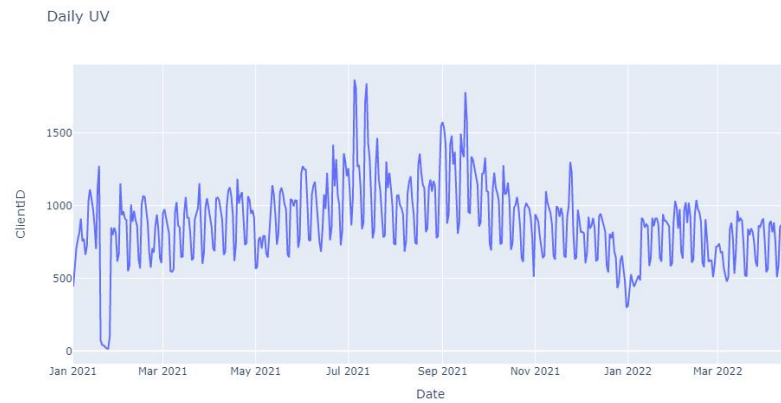


Figure 9. Daily UV

Source: [authors work]

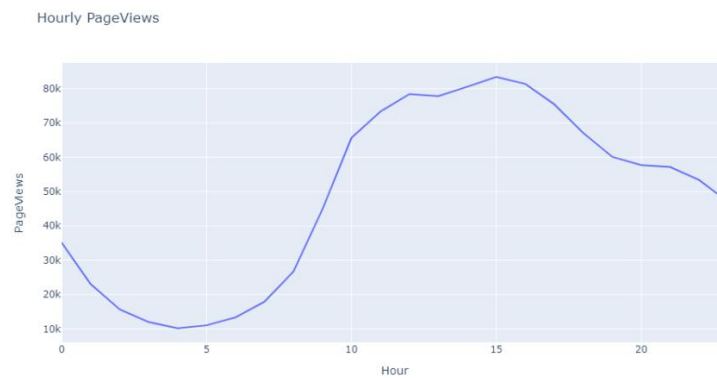


Figure 10. Hourly UV

Source: [authors work]

For the next step, the devices categories and operating systems which visits used to visit our site were analyzed. It is important since Intel and Apple have decided to leave Russian market, Windows and IOS technical support will become a threat and uncertainty. Therefore, it is necessary to clarify how many visitors we may lose under this case. In additional, a solution should be given just in case this situation happens. Insert the ‘DeviceCategory’ and ‘DeviceCategory’ parameters and group by PV, make visualization of these data, the graphs are as follow:

Device Type

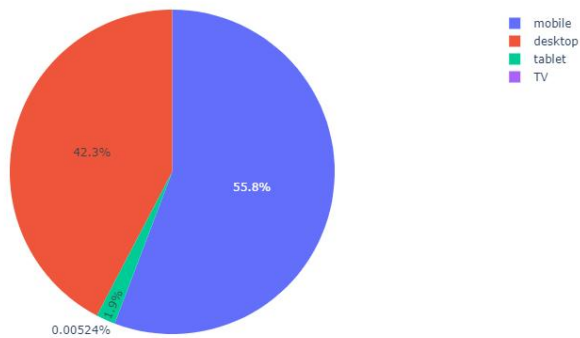


Figure 11. Device Type

Source: [authors work]

MobilePhone TOP 10 UV

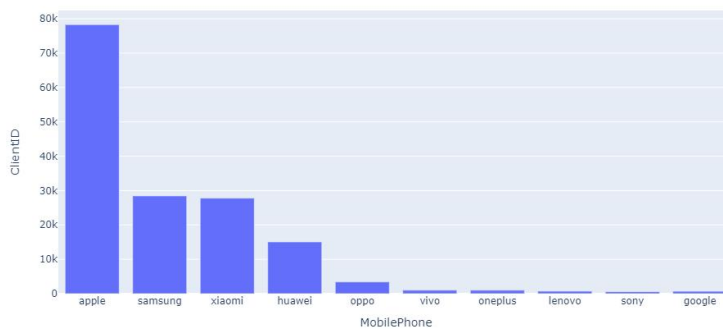


Figure 12. Mobile Phone Type To

Source: [authors work]

OperatingSystem

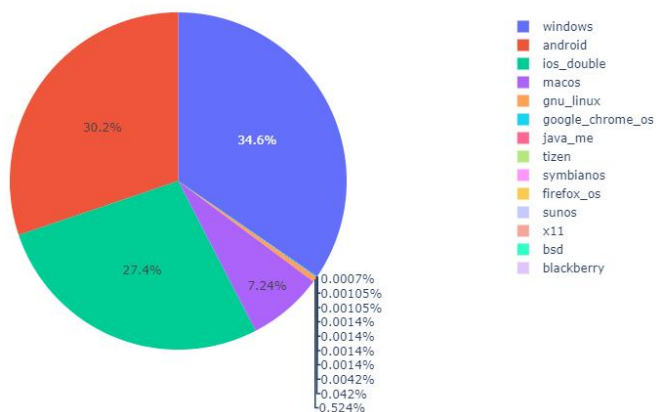


Figure 13. Operating System

Source: [authors work]

The main operating system is windows and IOS, mobile phone of visitors most are apple, Samsung, Xiaomi and Huawei. There is a question that based on the current Apple sanctions against Russia, will it affect the access to the GSOM website starting in March? Just in case this situation happening, the adaption of new operating system for the website is an alternative scheme, such as Android and Harmony OS (which provided by HUAWEI company).

After analyzing the dashboards, the following information was obtained that most users ages in 18-34, female user more than male, most user visit in daytime as what have mentioned in the previous result. The problem is that many pages have long loading time, most of them are over 5 seconds, such as Introduction page, Main page and Contacts GSOM SPBSU page (see Figure 14), they got high traffic but also have the high loading time, and the loading, it will affect the user experience and influence the conversion rate.

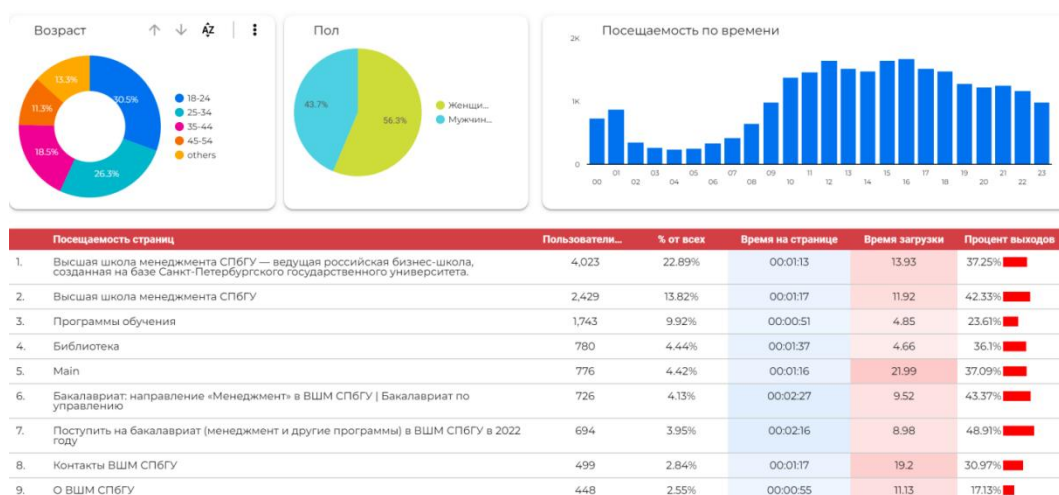


Figure 14. Dashboard1

Source: [Yandex Metrica]

According to Google research that when loading times increase from 1second to 3 seconds, the probability of the bounce (the visitor leaving right away) increases by 32%. If the page takes 5 seconds to load, the probability of a bounce rises by 90% (Matteo, 2020). Thus, the optimization of pages should be done in order to reduce the loading time. By the article of Matteo (2020) there are 9 ways to improve page loading speed:

1. Choose a performance-optimized hosting solution.
2. Compress and optimize your images.
3. Reduce the redirects.

4. Cache the web pages.
5. Enable browser caching.
6. Use asynchronous and defer loading for CSS and JavaScript files.
7. Minify CSS, JavaScript, and HTML.
8. Leverage a content delivery network (CDN).
9. Eliminate unnecessary plugins.

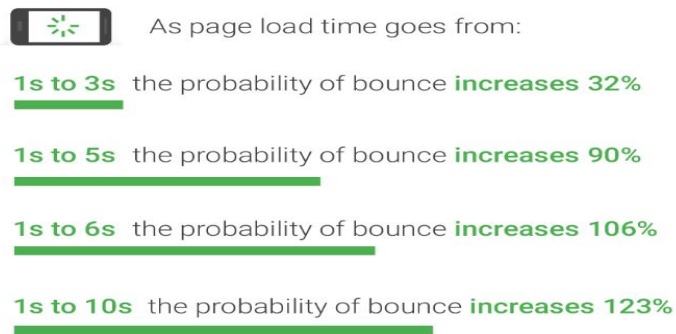


Figure 15. Loading time and bounce rate

Source: [Google/SOASTA Research, 2017]

For non-Russian users 61.7% traffic came from google search. Top social channel is Facebook. The search word ‘GSOM’ got high volume but the CTR in respond to ‘GSOM’ key works is only 1.7% among 16500 search results in google search engine, this needs to be checked and do some SEO. Same problem exists that some of the page has relative high loading time.

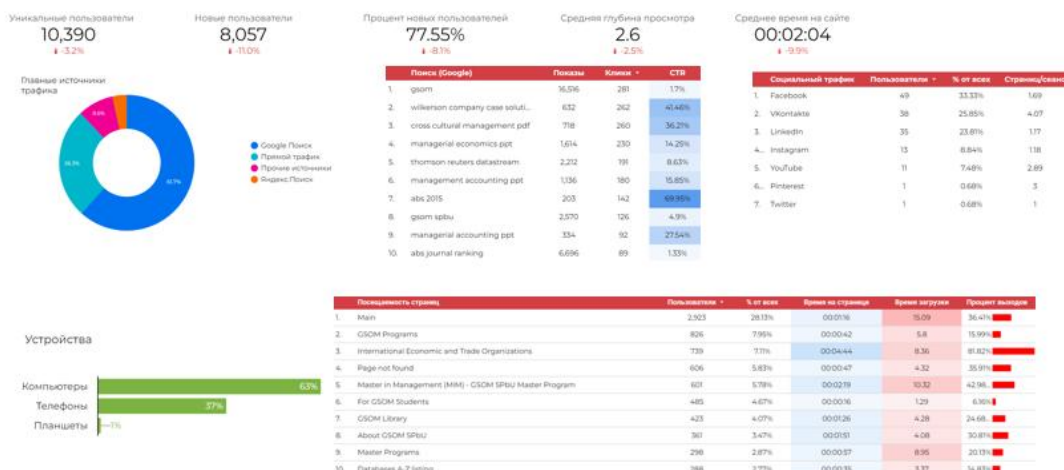


Figure 16. Dashboard 2

Source: [Yandex Metrica]

3.4 Analysis of international body of GSOM SPbU master programs applicants and partners

According to a report by RIA Novosti local time on March 7, the Russian government has approved the list of unfriendly countries and regions that day, including the United States, EU member states, the United Kingdom, Ukraine, Japan and some other countries and regions, a total of 48 ("RIA Novosti," 2022). In the perspective of high education industry of Russia, this news portends a possible loss of markets in these unfriendly countries for Russian universities.

From the data of GSOM official site visits by region before the crisis (see Figure 17), in addition to the Russian Federation, Kazakhstan, the United States, India, Ukraine and Germany are the top five sources of visitors, just few visits from friendly countries. In the light of the recent international situation, the number of visits from the so-called "Russia-unfriendly countries" in this list may change significantly at the beginning of the next academic year. Thus, GSOM may loss most of the visits because of the limitations and uncertainties with western market in the educational industry.

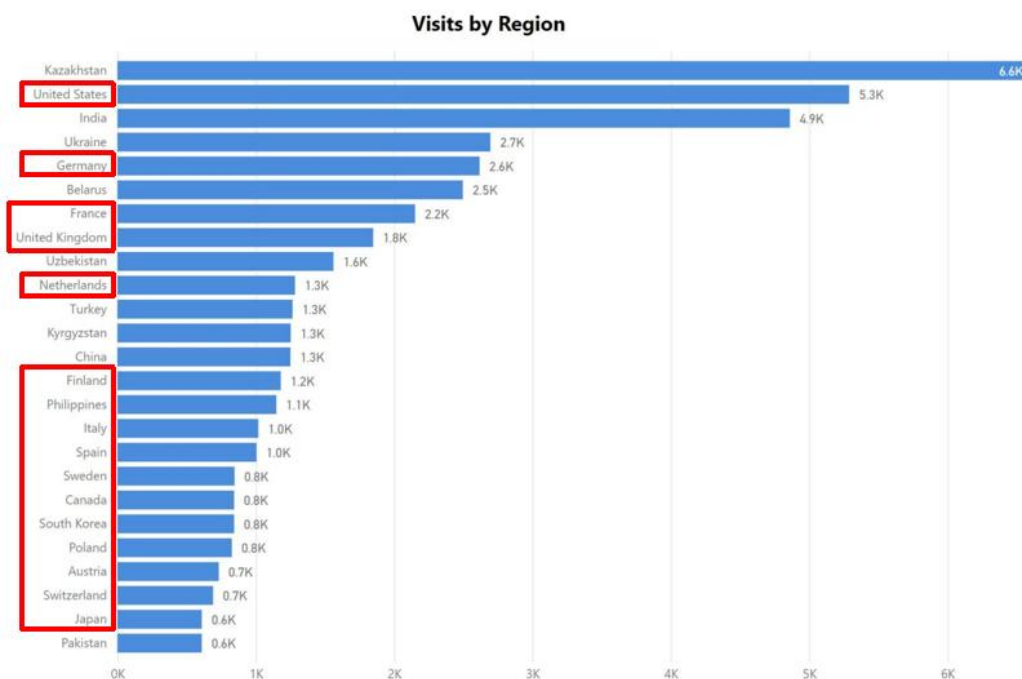


Figure 17. Visits by region

Source: [authors work]

A notable finding was that from the enrollment list there are many students from friendly countries especially China and India, but there are no promoting channels in these regions, thus the visits of these regions are low, below 2000 visits (see Figure 17). Most of the applicants were from China (24%) and India (18%), the foreign countries which has the highest enrolled students' rate were China (26%) and India (21%) (see Figure 19 and 20). China (20%) and France (29%) are the countries that offer the most exchange student places to GSOM (see Figure 18). As the current political situation, there are many limitations and uncertainties with western market in the educational industry. we think it could be a proper backup plan to make some marketing strategies for the countries which are friendly to Russia, especially Chinese market.

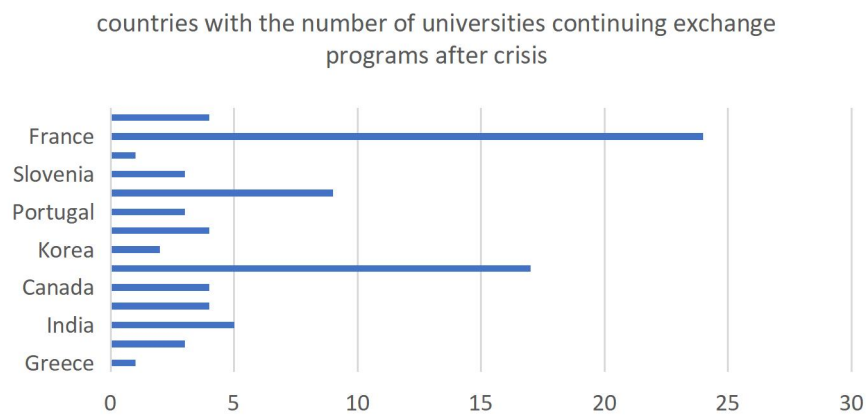


Figure 18. Countries with the number of universities continuing exchange programs

Source: [authors work]

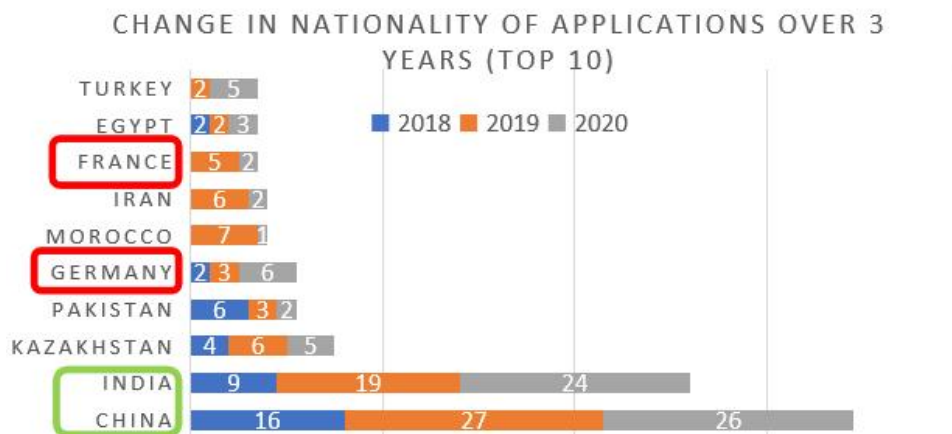


Figure 19. Applications over 3 years

Source: [authors work]

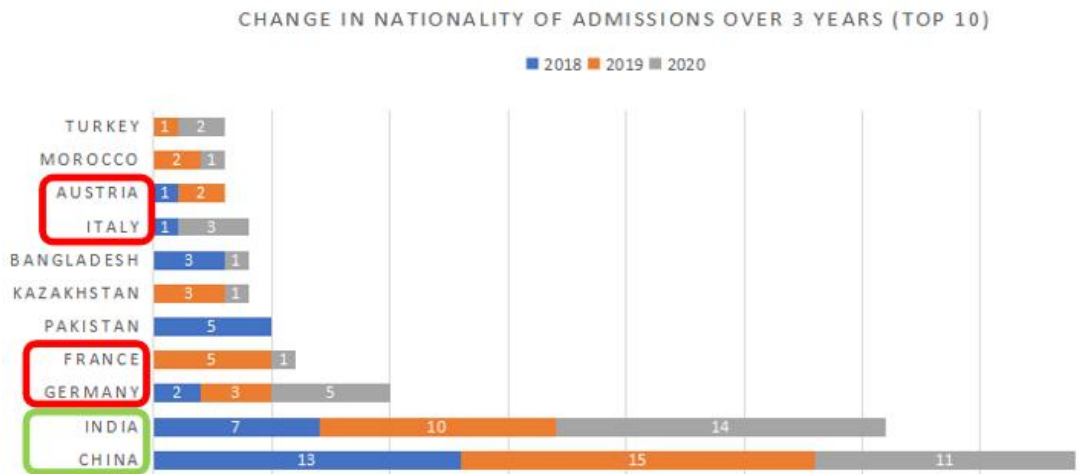


Figure 20. Admissions over 3 years

Source: [authors work]

According to the survey, the result of question 1 (see Figure 21) shows that only 2% of respondents are aroused interest/intention by official website of GSOM/SPbU and 4% of them are attracted by social media, which shows that GSOM/SPbU's existing marketing campaigns on social media are not reaching Chinese students well. The result of question 2 (see Figure 22) shows that 33% of the respondents had seen the publicity on Chinese social media platform, which means these channels can reach our target customers in some perspective. However, the authors did not find any official accounts of The Graduate School of Management/ St. Petersburg State University on these Chinese social media platforms. There are still 39% of Chinese student are unreachable via Chinese platforms, which means to do some marketing campaigns on Chinese platform is a good chance for both GSOM and SPbU. For question 3 (see Figure 23), only 4% of respondents chosen “not helpful”, which means 96% of the respondents thought that the existing education program at St. Petersburg State University had met their expectations, and they believe the students experiences at SPbU will help them with future career choice and career planning. The result shows that St. Petersburg State University is indeed vastly attractive to Chinese students.

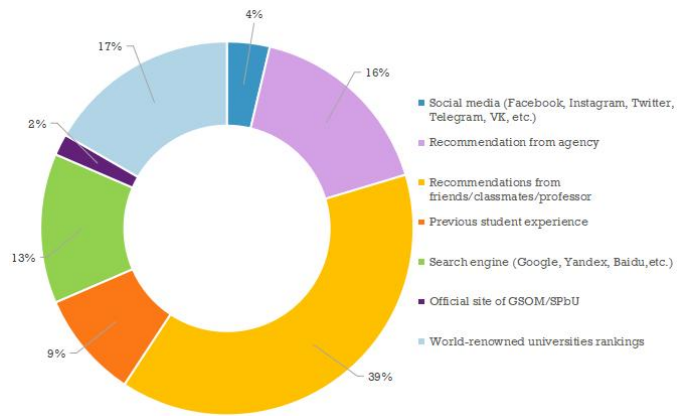


Figure 21. Result of survey Q1

Source: [authors work]

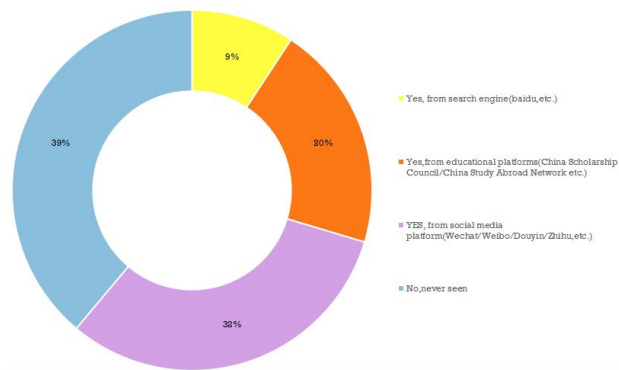


Figure 22. Result of survey Q2

Source: [authors work]

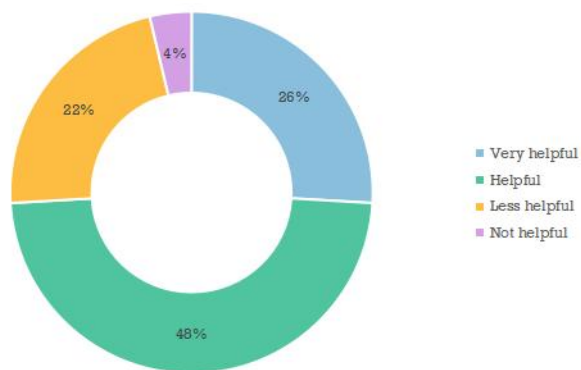


Figure 23. Result of survey Q3

Source: [authors work]

3.5 To Be GSOM marketing plan analysis

According to the results of the survey and the above analysis, due to the current political situation, there will be fewer international students from western countries, since China is a friendly country for Russia, and it has the highest rate of enrolled students in GSOM. As a result, it would be a good chance to promote in Chinese market. However, there is not any channels of GSOM to promote in Chinese market and no efforts have made for attracting Chinese student. Thus, in order to attract more Chinese applicants, we propose to improve marketing channels in Chinese market.

By analyzing the current international promoting activities which can't be fulfilled, we found the Facebook and Instagram international Channels are prohibited. As a substitution of the two channels, we provide with two Chinese online channels, Weibo and Douyin (TikTok China) are the most popular social network in China, thus it is a good opportunity to develop promoting channels in these two platforms. As there is no initiate SPbU official account in Weibo, we propose to communicate about official pages for SPbU and GSOM, because many western business schools have their official accounts at this platform. The age of targeted customers of WEIBO is 17-33, This is also the age of GSOM's target customers. In Douyin platform there are almost no official accounts of the International Business School on Douyin, but there are many official accounts of Chinese universities, and 90% of them have more than 100 thousand followers, therefore we can consider it's a effective way for educational marketing in China.

For offline promoting, there's a huge market in the overseas education agency institutions, it would be a good opportunity to collaborate with them in order to attract more applicants. From 2010 to 2019, the number of Chinese overseas study intermediaries has grown substantially, from less than 3,000 institutions in 2010 t to more than 3,7000 institutions in 2019. What's more, every year there are more than 935.9 thousand Chinese students are study aboard, and about 3% of total Chinese students studying in Russia (about 30000 students), among them there are 75%-80% of Chinese students study abroad through agency institutions (22500-24000 students).

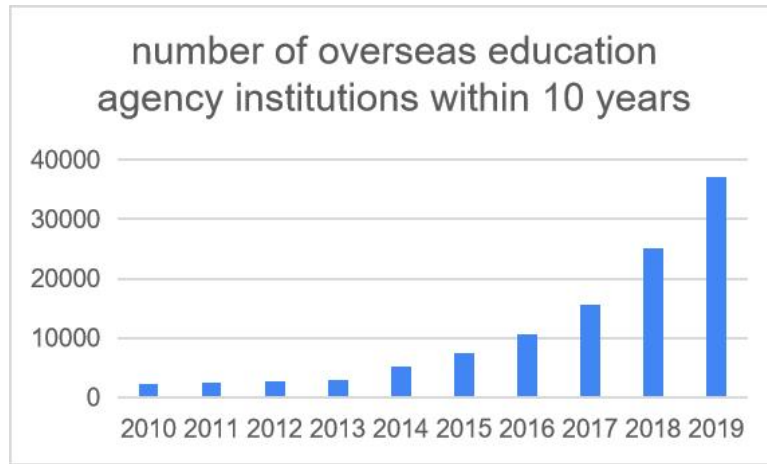


Figure 24. Number of overseas education agency institutions with 10 years

Source: (China Tianyancha Data Laboratory, 2019)

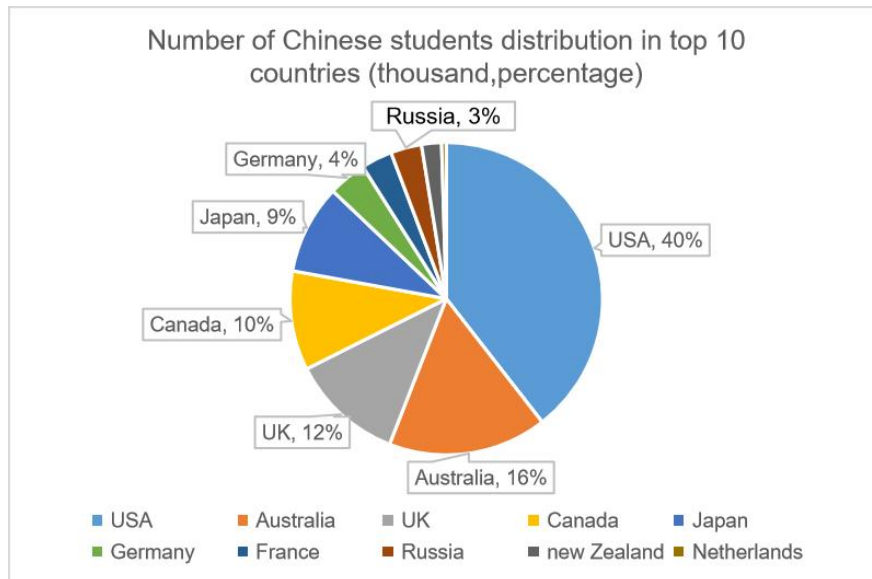


Figure 25. Number of Chinese students distribution in top 10 countries

Source: (Beijing Zhiyan Data Research Center, 2019)

After analyzing the promoting channels in China, the cost and limitations of each platform have been listed in the following table (see table 3).

Table 3. Coat and Limitations of Chinese promoting channels

Promoting channels	Cost of each step	Limitations
--------------------	-------------------	-------------

Weibo	<ul style="list-style-type: none"> ● Open an account- Free ● Get approval of official account - Free ● Promoting:0.45p/per view 	<ul style="list-style-type: none"> ● Need People who understand Chinese to operate this account ● Need to upload articles or videos to maintain the account frequently (min:3 times/week) ● Need to check private messages daily, there may be consultation questions from potential applicants
Douying	<ul style="list-style-type: none"> ● Open an account- Free ● Get approval of official account - Free ● Promoting:12.5p/ per follower 3p/per view/comment 	
Agency institutions	<ul style="list-style-type: none"> ● Get contact with Agency institutions - free ● Collaborate and have contract - no data ● Maintain the relationship - free 	<ul style="list-style-type: none"> ● Need time to get contact with them ● Pre-work need long time to accomplish ● May have negative influence on reputation of the university

Source: [authors work]

3.6 Recommendations on marketing plan improvement

The analysis of the problems on GSOM's marketing plan can be summarized through the

following points:

- Problems on GSOM official website: The university websites are a crucial tool in the information-gathering stage of students' decision-making process. Potential students' first impressions are influenced by it. Some pages of GSOM official website have high loading time, it may adversely affect the user experience. Because of the sanction, Apple and Intel are leaving Russia market, there is the possibility that it will affect the access to the GSOM website since the main operating system is Windows and IOS.
- Problems on marketing channels: After the crisis 2022, the Meta company have left Russian market, Facebook and Instagram is prohibited in Russia, thus the marketing channels in these two platforms are unavailable, meanwhile GSOM marketing department have no ads on Google since March 2022. For this reason, GSOM have lost the marketing channels on international market.
- Problems on the markets of Russia unfriendly countries: After the crisis, 48 countries have been listed as Russian unfriendly countries and restrict entry to citizens of some of these countries by the Russian Federation. Some of the countries sanction Russia in the field of trade, finance, technology and education. As a consequence, GSOM may lose the students from these countries and the collaborations with the university of these countries also have been canceled.

In order to address those issues, and reach the business goal of GSOM, the following set of recommendations was prepared (see Table 4 below).

Table 4. Recommendations

Empirical data	Data-driven performance	Recommendations
GSOM website log data, Yandex metrics dashboards	1.7% CTR. 8s -21.99s long page loading time; the period of highest traffic	3 recommendations on website optimization 1. New operation system adaption: android and Harmony OS. 2. Loading time reduction: main page, contact page, MiM page, etc. up to 5s. 3.Reschedule main events to the high traffic

		period: early June or early September, Monday to Friday, 15:00.
As-Is GSOM marketing plan, GSOM website log data	60% of total traffic loss over all channels affected by political crisis	Improve marketing plan by making a shift: 1. From Facebook and Instagram to VK and Telegram. 2. From Google search engine to Yandex Search engine.
Master students enrollment statistics, List of exchanging program universities, Survey accomplished by authors	26% of total GSOM master international students were from China; 5 Chinese business schools continue provide exchange places for GSOM; 30000 Chinese students study in Russia every year	To improve marketing channels in Chinese market by: 1. Develop Douyin promoting Channels: Make a SPbU/GSOM official account and post relevant information (program introduction, open days, promoting activities) 2. Develop Weibo promoting channels: Make a SPbU/GSOM official account and post videos of the events. 3. Collaborate with Chinese overseas educational agency institutions: Xintong Education, JIL Education, MeiShi Education, Woodpecker Education, Longre Education (TOP 5 agency institutions in China)

Source: [authors work]

Marketing activities	Recommendation	Type
ONLINE COMMUNICATION		
Website	Optimize the website to adapt for other operating system (android and Harmony OS)	process+product
	Optimize pages and reduce loading time: Main page, MIM program page, contacts page	process+product
	Reschedule main events to the high traffic period: early June or early September, Monday to Friday, 15:00	process
	Add Chinese language to the website	process
ADVERTISING		
SMM(social media marketing)	Put marketing budget on Facebook and Instagram channels to VK and telegram channels	promoting
	Develop Douyin Marketing Channels	promoting
	Develop Weibo marketing channels	promoting
Search engine	CTR from the Google search engine is too low, need to do SEO	promoting + process
	Put the ads budget from Google to Yandex Search engine	promoting
BTL(Below-the-Line)	Collaborate with Chinese overseas educational agency institutions	promoting

Figure 26. Recommendations on marketing plan improvement based on GSOM market plan

Source: [authors work]

Conclusion

This research was devoted to proposing recommendations on marketing plan changes for the Graduate School of Management in order to enroll international students under the global political crisis 2022. The whole study revolves around two research questions. To answer the first research question of how the political crisis affects GSOM's marketing program, we analyzed the impact of the crisis on GSOM's marketing plan at different levels in the context of political issues, and concluded that 48% of the marketing campaigns could not be completed due to the political crisis, thus having a high chance of leading to a decrease in international applicants. To answer the second research question of what can be done in the situation of the revealed limitations, 7 sources of data were analyzed (see Table 2), leading to recommendations in three directions: website optimization, marketing channels adjustment, Chinese market development.

We propose 3 recommendations on website optimization: new operation system adaption; loading time reduction up to 5; reschedule main events to the high traffic period. To adjust some of the current marketing channels to reduce the impact of the promoting channels which influenced by the political crisis, and transferred the traffic (60% of total traffic) from these unavailable channels to the available channels, in order to maintain the number of applicants by making a shift: from Facebook and Instagram to VK and Telegram; from Google search engine to Yandex Search engine. The number of Chinese applicant's accounts for 24% of the total international students of GSOM, and there are about 30000 Chinese students studying in Russia every year, but GSOM does not have any marketing channels in China, so the development of the Chinese market is an effective way to increase the application number of Chinese students. To improve marketing channels in Chinese market by: develop Douyin promoting Channel; develop Weibo promoting channel; collaborate with Chinese overseas educational agency institution (see Table 4 for details).

List of references

1. ABOUT GSOM SPBU (n.d.). Retrieved March 18, 2022, from *GSOM Official Website*: <https://gsom.spbu.ru/en/about-gsom/>
2. Bernard, J.(2009). Understanding User-Web Interactions via Web Analytics Synthesis Lectures on Information Concepts, Retrieval, and Services. Retrieved April 5,2022, from <https://doi.org/10.2200/S00191ED1V01Y200904ICR006>
3. Bryman, A., & Bell, A. (2011). *Business Research Methods*. Oxford University Press.
4. Burby, J., Brown, A., & WAA Standards Committee. (2007). *Web analytics definitions*. Washington DC: Web Analytics Association
5. Christensen, L. et al. (2010). *Marknadsundersökning – en handbok*. Tredje uppl. Studentlitteratur, Lund.
6. Enache, I-C. (2011) Marketing higher education using the 7Ps framework. *Bulletin of the Transylvania University of Brasov*, 4(1),23-30
7. Fazeldehkordi, E., Akanbi, OA. & Amiri, IS. (2014). A Machine-Learning Approach to Phishing Detection and Defense. Retrieved February 28, 2022, from <https://doi.org/10.1016/c2014-0-03762-8>.
8. Ghauri, P., Strange, R., & Gronhaug, K. (2020). *Research methods in business studies*. Cambridge University Press.
9. Hayes T. 2007. Delphi study of the future of marketing of higher education. *Journal of Business Research*, 60(9), 927–931.
10. Ivy, J. (2008). A new higher education marketing mix: The 7P's for MBA marketing. *International Journal of Educational Management*, 22(4), 288-299
11. Jackson, M. (2007, January 22). Analytics: Deciphering the Data. *Ecommerce guide* Retrieved March 30,2022, from <http://www.ecommerce-guide.com/resources/article.php/3655251>.
12. Joint Statement From AACSB, AMBA & BGA, and EFMD on Ukraine. (2022, March 11). Retrieved April 26,2022, from AACSB: <https://www.aacsb.edu/media-center/news/2022/03/joint-statement-ukraine>
13. Kotler, Ph. (1991). *Marketing Management*, Prentice Hall International.

14. Kotler, Philip & Karen F.A. Fox. (1995). *Strategic Marketing for Educational Institution*. New Jersey: Prentice-Hall, Inc
15. Lauterborn, B. (1990). New marketing litany; Four P's passe; C-words take over. Retrieved March 30, 2022, from http://rlauterborn.com/pubs/pdfs/4_Cs.pdf
16. Marshall, J. (n.d.). Seven Deadly Web Analytics Sins. Retrieved March 30, 2022, from http://www.clicktracks.com/insidetrack/articles/7_deadly_webanalytics_sins01.php
17. Matteo, D. (2020, October 15). 9 Quick Ways to Improve Page Loading Speed. *Hubspot blog*. Retrieved May 1, 2022, from <https://blog.hubspot.com/marketing/how-to-reduce-your-websites-page-speed>
18. McCarthy, E. Jerome (1960). *Basic marketing: A managerial approach*.
19. Moro, S., Laureano, R. & Cortez, P. (2011). Using data mining for bank direct marketing: An application of the crisp-dm methodology. Retrieved February 20, 2022, from <https://repositorium.sdum.uminho.pt/handle/1822/14838>
20. Moules, J. (2019, June 2). How business schools compete in a disrupted market. Retrieved March 30, 2022, from Financial Times: <https://www.ft.com/content/6a77610e-76f2-11e9-b0ec-7dff87b9a4a2>
21. Nicolescu, L., & Paun, C. (2009). Relating Higher Education with the Labour Market: Graduates 'Expectations and Employers' Requirements. *Tertiary Education and Management*, 15, 17-33.
22. Oleg, B. (2022, February.24). Kremlin: Russia Launched Operation With Aim of Clearing Ukraine of Nazis. Retrieved April 26, 2022, from <https://sputniknews.com/2022/02/24/kremlin-russia-launched-operation-with-aim-of-clearing-ukraine-of-nazis-1093331876.html>
23. Oplatka, I. (2009, June 19). Organizational citizenship behavior in teaching: The consequences for teachers, pupils, and the school. *Emerald insight*. Retrieved March 27, 2022, from <https://www.emerald.com/insight/content/doi/10.1108/09513540910970476/full/html>

24. Paul H. (2022, March 4). Ukraine crisis: a message from THE's chief executive. *THE website*. Retrieved April 26,2022, from <https://academic-cms.prd.the-internal.com/ukraine-crisis-message-these-chief-executive>
25. Response to the crisis of Ukraine. (2022, April 4). Retrieved April 26,2022, from QS: <https://www.qs.com/ukraine-crisis/>
26. Russia Restricts Flights of Airlines of 36 Countries in Response to Bans on Air Travels. (2022, February 28). Retrieved April 26, 2022, from Sputnik news: <https://sputniknews.com/20220228/russia-restricts-flights-of-airlines-of-36-countries-in-response-to-bans-on-air-travels--1093449652.html>
27. The government approved the list of countries unfriendly to Russia. (2022, March 7). Retrieved April 26,2022, from RIA Novosti: <https://ria.ru/20220307/perechen-1777030742.html>
28. These Companies Have Left Russia: The List Across Tech, Entertainment, Finance, Sports. (2022, March 4). Retrieved April 26,2022, from CNET: <https://www.cnet.com/news/politics/what-companies-have-left-russia-see-the-list-across-tech-entertainment-and-financial-institutions/>
29. Thomas, H. (2007). Business school strategy and the metrics for success. *Journal of Management Development*. Retrieved March 30, 2022, from <https://www.emerald.com/insight/content/doi/10.1108/02621710710720068/full/html?journalCode=jmd>
30. Web Analytics Association.(n.d.).Onsite Behavior - Path Analysis. Retrieved March 27, 2022, from <http://www.Webanalyticsassociation.org/attachments/contentmanagers/336/1%20Path%20AnAnalys. Doc>
31. Zeithaml, V., A., Parasuraman, A., & Berry, L., L., (1985). Problems and strategies in services marketing. Retrieved February 20, 2022, from <https://journals.sagepub.com/doi/abs/10.1177/002224298504900203>

Acknowledgement

At the end of this master thesis, we would like to express our gratitude to everyone who has given support and help in this research. In particular, we are profoundly indebted to our supervisor Sofiya Vitalevna Zhukova, who was very generous with her time and knowledge and assisted us in each step to complete the thesis. We are grateful to Vasiliy Garshin, who had helped with the access of log data from the GSOM site, which is the basis of this research; Our sincere thanks to Daria Lebedeva, the meeting with her gives us not only a lot of business understanding of GSOM but also the basic dataset of various activities we need. Appreciation is given to the office of GSOM, who helped with sending the questionnaire to the respondents. We also gratefully acknowledge the staff, officers, and volunteer workers of GSOM and SPbU for giving us all necessary assistance during our student experience.

We also would like to give our thanks to Tatyana Albertovna Gavrilova, Dmitriy Vyacheslavovich Kudryavtsev, Vladimir Andreevich Gorovoy, and Leonid Chernyy, we were hardworking during the time of writing with their suggestions, sympathy, patience and encouragement. Last but not least, thanks to our two families, who have been a truly important and indispensable source of material and moral support.

Appendix

Appendix 1. The necessary Python libraries for the project realization

```
In [2]: import os
from io import StringIO
import warnings
warnings.simplefilter("ignore")
import json
import requests
import pandas as pd
pd.set_option("display.max_columns", None)
pd.set_option("display.max_rows", 100)
import numpy as np
from sklearn import preprocessing
from matplotlib import pyplot as plt
import seaborn as sns
from collections import Counter
import missingno as mso
import plotly.express as px
# pd.options.plotting.backend = "matplotlib"
pd.options.plotting.backend = "plotly"
```

Appendix 2. Data import

```
In [3]: def get_data(query):
CH_HOST = 'http://10.129.0.30'
CH_PORT = '8123'
SSL_VERIFY = True
host = ''.join([CH_HOST, CH_PORT])
user_name=os.environ['CLICKHOUSE_USER']
user_passwd=os.environ['CLICKHOUSE_PASSWORD']
if (user_name == '') and (user_passwd == ''):
    r = requests.post(host, params=query_dict, verify=SSL_VERIFY)
else:
    r = requests.post(host, data=f"{query} FORMAT CSVWithNames",
                      auth=(user_name, user_passwd), verify=SSL_VERIFY)
print("request status code:", r.status_code)
df=pd.read_csv(StringIO(r.text),na_values='[]')
return df
```

Appendix 3. The imported data sample example

```
In [6]: df.tail()
```

Out[6]:

	Bounce	Browser	BrowserCountry	BrowserEngine	BrowserEngineVersion1	BrowserEngineVersion2	BrowserEngineVersion3	BrowserEngineVersion
485583	0	chromemobile	NaN	WebKit	537	36	0	
485584	0	safari_mobile	us	WebKit	605	1	15	
485585	1	chrome	ru	WebKit	537	36	0	
485586	1	chromemobile	ru	WebKit	537	36	0	
485587	0	firefox_mobile	ru	Gecko	89	0	0	

Appendix 4. Missing data processing and visualization

```
In [7]: df1=df.dropna(axis=1,how='all') #删除全部为空的列 131列减少到了84列,并按时间升序排序
df1.shape
Out[7]: (485588, 84)
```

```
In [8]: df1.isnull().mean().to_frame()*100 #计算缺失值比例
Out[8]:
```

	Bounce	Browser	BrowserCountry	BrowserEngine	BrowserEngineVersion1	BrowserEngineVersion2	BrowserEngineVersion3	BrowserEngineVersion4	Browse
0	0.0	0.02636	18.539173	0.001853	0.0	0.0	0.0	0.0	0.0

```
In [9]: df1=df1.convert_dtypes()
```

```
In [10]: msno.matrix(df1,labels=True) #缺失列缺失情况可视化,越稀疏说明缺失越多
Out[10]: <AxesSubplot:>
```

Appendix 5. Time fields convert and insert

```
In [12]: #Convert to datetime format
for i in ['Date','DateTime','DateTimeUTC']:
    df1[i]=pd.to_datetime(df1[i],errors='ignore')
df1=df1.sort_values('DateTime')
# insert date seg. dim
df1['Weekday']=df1['Date'].dt.day_name()
df1['Month']=df1['Date'].dt.month_name()
df1['Year_Month']=df1['Date'].dt.strftime('%Y-%m')
df1['Year']=df1['Date'].dt.year
df1['Hour']=df1['DateTime'].dt.hour
df1[['Date','DateTime','DateTimeUTC']].dtypes
Out[12]: Date          datetime64[ns]
DateTime         datetime64[ns]
DateTimeUTC      datetime64[ns]
dtype: object
```

Appendix 6. Last Traffic Source

```
In [26]: LastTrafficSource=groupby_pv(df1,'LastTrafficSource')
LastTrafficSource
```

Out[26]:

	LastTrafficSource	PageViews	ClientID	IsNewUser
5	organic	664506	180125	183978
1	direct	332711	88012	84024
3	internal	109705	15233	5382
8	referral	38174	13060	11641
10	social	30586	15508	14486
0	ad	3571	1810	1597
2	email	624	348	271
4	messenger	508	268	204
7	recommend	475	248	233
11	undefined	308	3	214
9	saved	88	25	19
6	qrcode	10	8	8

Appendix 7. Devices category

```
In [30]: DeviceCategory=groupby_pv(df1,'DeviceCategory')
DeviceCategory['DeviceCategory']=DeviceCategory['DeviceCategory'].map({1:'desktop',2:'mobile',3:'tablet',4:'TV'})
DeviceCategory
```

Out[30]:

	DeviceCategory	PageViews	ClientID	IsNewUser
0	desktop	721009	122267	130171
1	mobile	441579	160948	166199
2	tablet	18521	5472	5672
3	TV	167	15	15

Appendix 8. Operating System Type

```
In [34]: OperatingSystem=groupby_pv(df1,'OperatingSystemRoot')
OperatingSystem
```

Out[34]:

	OperatingSystemRoot	PageViews	ClientID	IsNewUser
12	windows	556522	99721	105815
6	ios_double	238676	79118	81551
0	android	220336	89907	89922
8	macos	159565	20918	22630
4	gnu_linux	4452	1511	1568
5	google_chrome_os	517	121	123
11	tizen	140	4	4
7	java_me	17	12	11
10	symbianos	6	4	4
13	x11	6	3	3
3	firefox_os	5	4	4
9	sunos	5	4	4
2	bsd	4	3	3
1	blackberry	3	2	2

激
转:

Appendix 9. Start URL

```
In [37]: StartURL=df1.groupby(by='StartURL', as_index=False)['PageViews', 'ClientID', 'Bounce'].agg({'PageViews': 'sum', 'ClientID': 'count', 'Bounce': 'sum'})
StartURL.head(20)
```

Out[37]:

	StartURL	PageViews	ClientID	Bounce
135	https://gsom.spbu.ru/	416022	112587	34990
3297	https://gsom.spbu.ru/en/	45679	11533	3928
9840	https://gsom.spbu.ru/gsom/library/	37212	11504	3911
10180	https://gsom.spbu.ru/programmes/bachelor/admis...	28423	13406	6283
1532	https://gsom.spbu.ru/all_news/event2020-03-13_1/	24409	15297	8099
10176	https://gsom.spbu.ru/programmes/	16679	5691	2606
10209	https://gsom.spbu.ru/programmes/bachelor/mede...	16189	9169	6070
3226	https://gsom.spbu.ru/blog/blog2020-12-03/	14758	13898	12532
10324	https://gsom.spbu.ru/programmes/graduate/	13331	3974	1125
9867	https://gsom.spbu.ru/gsom/library/index/	8906	3012	822
10177	https://gsom.spbu.ru/programmes/bachelor/	8196	3077	1341
10255	https://gsom.spbu.ru/programmes/emba/	7848	2933	1200
10390	https://gsom.spbu.ru/programmes/graduate/mcf/	7034	3913	1701
10217	https://gsom.spbu.ru/programmes/bachelor/publi...	7007	4499	2962
641	https://gsom.spbu.ru/about-gsom/faculty/	6770	1306	364
471	https://gsom.spbu.ru/about-gsom/	6534	1773	776

Appendix 10. Visits by region

```
In [38]: RegionCountry=groupby_pv(df1, 'RegionCountry')
RegionCountry.head(10)
```

Out[38]:

	RegionCountry	PageViews	ClientID	IsNewUser
142	Russia	985791	226926	237680
90	Kazakhstan	17083	6889	7015
80	India	16547	5353	5529
183	United States	11943	5778	5707
16	Belarus	11098	2578	2647
67	Germany	10122	2815	2812
62	France	8883	2257	2259
177	Turkey	5859	1321	1344
182	United Kingdom	5619	2087	2060
37	China	5054	1289	1354

关于圣彼得堡国立大学在中国市场宣传程度的调查

* 1. 在入学申请前，您从哪个渠道获取了圣彼得堡国立大学的相关信息使您产生了申请的兴趣/意向？

- 社交媒体（Facebook, Ins, 推特, Telegram, VK等）
- 中介推荐
- 朋友同学或老师推荐
- 在本校有学习经历
- 搜索引擎（谷歌, yandex, 百度）
- SPbU或GSOM官网
- 世界知名大学榜单

* 2. 您是否曾在中国的平台上看到过任何有关圣彼得堡国立大学官方的宣传活动？

- 是，在社交媒体上（微信，微博，抖音，b站，知乎，等）
- 是，在教育平台上（国家留学基金委，中国留学网，教育部留学服务中心，留学人才网等）
- 是，在搜索引擎上（百度等）
- 从未看见过

* 3. 您所选的专业是否对您未来的职业选择或者职业规划有帮助？

- 很有帮助
- 有帮助
- 帮助较少
- 没有帮助

Q1: Before applying for admission, from which channel did you obtain relevant information about GSOM/SPbU that aroused your interest/intention to apply?

- Social media (Facebook, Instagram, Twitter, Telegram, VK, etc.)
- Recommendation from agency
- Recommendations from friends/classmates/professor
- Previous student experience
- Search engine (Google, Yandex, Baidu, etc.)
- Official site of GSOM/SPbU
- World-renowned universities rankings

Q2: Have you ever seen any information about events or promotional booklet about SPbU/GSOM published on Chinese platforms?

- Yes, from search engine (baidu, etc.)
- Yes, from educational platforms
(China Scholarship Council/China Study Abroad Network/Ministry of Education Study Abroad Service Center/Study Abroad Talent Network, etc.)
- Yes, from social media platform (WeChat/Weibo/Douyin/Bilibili/Zhihu,etc.)
- No, never seen

Q3: Does your chosen program really helped in your future career choice and career planning?

- Very helpful
- Helpful
- Less helpful
- Not helpful

Appendix 13. Example of cost on promoting in Douying

< **DOU+上热门** 品

期望提升 [?] **粉丝量** > 投放时长 [?] **2天** >

ai follower/ duration
若内容含第三方产品服务, 你需要提交相关资质 前往提交

把视频推荐给潜在兴趣用户 [?]

系统智能推荐

自定义定向推荐 **customize**

性别(单选) **gender**

不限 男 女

年龄(多选) **age**

不限 18-23岁 24-30岁

31-40岁 41-50岁

地域(单选) **region**

全国 按省市 > 按区县 >

按商圈 > 按附近区域 >

兴趣标签(多选) **label**

不限 生活家电 装修设计

箱包 鞋靴 酒水

达人相似粉丝 **followers of celebrities**

不限 更多 >

预计新增粉丝人数 [?]

预估转化数据仅供参考

Estimated number of new followers

64-243人

投放金额 [?] **cost**

¥ 200 ¥ 400 ¥ 600

¥ 800 ¥ 1000 自定义

投放金额 **合计: ¥ 200**

优惠券 **无可用优惠券 >**

已阅读并同意 **数据推广服务协议**

¥ 200

预计带来转化数 [?]

预估转化数据仅供参考

Estimated number of views/Comment

232-1164次

投放金额 [?]

¥ 200 ¥ 400 ¥ 600

¥ 800 ¥ 1000 自定义

¥ 200