



GO-TO-MARKET STRATEGY FOR PROITIVITY TO ENTER IT
EDUCATIONAL SECTOR IN KAZAKHSTAN AND ABROAD

by

Aigerim Toktagulova

Almas Kartbayev

Aray Zhaparova

Natalia Tkachenko

Rena Dilixiati

PRACTICUM

Submitted in partial fulfillment of the requirements
for the degree of Master of Business Administration
in the Graduate School of Business

Nazarbayev University, 2023

Astana, Kazakhstan

Advisor: Dr. Jiyang Dong

Abstract

The current digital era dictates its own rules with the demand for experienced IT professionals, driven by the rapid development of technology in all industries. To solve this problem, the Government of Kazakhstan has launched the TechOrda program, intending to train 100,000 IT specialists by 2025. The newly established ProITivity School of Information Technology joined this mission by receiving vouchers from the government for free tuition. However, given that the program ends next year and the number of vouchers is limited, ProITivity recognizes the need for a more sustainable and diversified strategy.

This project explores how ProITivity can abandon its dependence on government funding and enter the B2B and B2C markets, targeting adult and younger students throughout Kazakhstan and abroad. The main goal is to develop a market entry strategy that positions ProITivity as a leading provider of IT education services, even though it goes beyond government support.

The main areas of work include identifying competitive advantages, improving customer segmentation, and developing a pricing model that considers both short-term and long-term goals. Initial results show that Kazakhstan represents an attractive but competitive market landscape, where numerous providers of EdTech services already work in educational institutions. Competitor analysis identifies gaps in specific training modules, and pricing analysis points to potential entry points.

Two strategies are proposed based on a deep primary and secondary data analysis. The first is to keep and promote the same product with different marketing approaches. The second is updating the product so alumni are more experienced. Ultimately, these strategies will allow ProITivity to grow steadily and contribute to the development of Kazakhstan's digital workforce while exploring opportunities to expand the availability of IT education outside the country.

Table of contents

| | |
|--|-----------|
| Abstract | 1 |
| Introduction of company and project background | 7 |
| Research question | 7 |
| Methodology | 8 |
| External and Internal Situation Analysis | 10 |
| Internal Situation Analysis | 10 |
| Company’s Organizational structure | 10 |
| Company’s financial performance | 10 |
| Current company’s customers..... | 11 |
| External analysis..... | 12 |
| 1.1 PESTEL analysis | 12 |
| 1.2 Porter’s Five Forces | 24 |
| Summary of Internal and External Analysis. | 29 |
| Survey, Interview Results, and Overall Key Findings | 30 |
| Survey results | 30 |
| The Importance of Practical Experience and Internships | 31 |
| Course improvement | 32 |

| | |
|--|-----------|
| Growing Demand for Data Analysis Courses..... | 32 |
| Challenges from Competitors and Market Saturation | 33 |
| Challenges from potential clients..... | 34 |
| Strategies for Marketing and Leveraging Alumni Networks..... | 34 |
| Strategies and General recommendation..... | 36 |
| Strategy I. Remain the same product..... | 36 |
| Marketing strategies | 36 |
| Quantitative Analysis | 39 |
| Recommendations | 42 |
| Strategy II. Update the product so it teaches from the beginning to strong juniors | 44 |
| Quantitative analysis | 49 |
| Recommendations | 50 |
| Conclusion..... | 52 |
| Bibliography | 54 |
| Appendices | 57 |
| Appendix A. The current financial statement of the ProITivity school..... | 57 |
| Appendix B. Interview with Islam Derbissalin, BIDynamics..... | 59 |

| | |
|--|-----|
| Appendix C. Interview with Dinara Mussayeva, Experience with DataBoom | 66 |
| Appendix D. Interview with Anarbek Utegulov, AstanaHub | 68 |
| Appendix E - Meeting with Chinese Construction Corporation leaders..... | 71 |
| The thoughts behind collaborating with Chinese companies in the future | 72 |
| Appendix F. Insights from Industry Interviews on Data Analytics and Team Development..... | 73 |
| Appendix G - Interviews with granted students (ProITivity) | 76 |
| Appendix H - interview with Alexey Dral - owner of BigData Team..... | 80 |
| Appendix I - Interviews with self-payees -ProITivity | 82 |
| Appendix J - interview with self-payees from other schools | 86 |
| Appendix K. Basic information of courses on Coursera..... | 90 |
| Appendix L. Detailed description of leading competitors. | 106 |
| Appendix M Research of data analysis training needs. | 113 |
| Appendix N. Salaries and Requirements for Teaching IT Industry on HH.. | 135 |
| Appendix O. Strategy. Go abroad by offering pre-recorded courses in English and Russian on basic and intermediate data analysis. | 137 |
| Appendix P. Break-even and NPV calculations for “remain the same product” strategy aggressive marketing approach..... | 141 |

Appendix Q. Break-even and NPV calculations for “remain the same product” strategy corporate sales approach.....144

Appendix R. Break-even and NPV calculations for “updated course till strong junior” strategy147

Appendix S. Break-even and NPV calculations for “updated course till strong junior” strategy with internships for students via partnering with companies.
.....150

Introduction of company and project background

ProITivity ([ProITivity](#), n.d.) is an online school offering programming and data analysis education. The courses aim to provide students with advanced skills and knowledge relevant to industry. It was established in 2023 with the support of the TechOrda program initiated by the Government. An experienced teacher teaches the ProITivity curriculum. The teaching format, primarily online, allows flexibility to study materials at a student's pace from anywhere in the world. The school provides a comprehensive curriculum and student support, mainly for beginners and seasoned professionals looking to advance their careers. ProITivity is the Astana Hub (AstanaHub, n.d.) Participant and eligible for a preferential tax regime.

Research question

With the program's closure looming next year and the challenges with grants, the B2G market is not sustainable. In response, ProITivity is considering a shift from B2G to B2B and B2C markets.

ProITivity can follow several strategies to achieve success after TechOrda closes. This analysis evaluates opportunities to enter B2B or B2C markets and elaborates on different methods and techniques for success. We provided recommendations for implementing the best alternatives.

Methodology

The methodology for better understanding and analyzing the problem involves evaluating primary and secondary data.

Primary data collection includes launching surveys, conducting interviews, and in-depth analysis with AstanHub. (AstanaHub, n.d.), successful schools, and companies interested in data analysis outsourcing or hiring students. To provide customer development, we arranged interviews with alums and current students of ProITivity school. We also conducted interviews with alums from other schools like DataBoom school (Databoom, n.d.) People who learned data analysis and data science independently via educational platforms like Coursera (Coursera, n.d.), Udemy (Udemy, n.d.), Udacity (Udacity, n.d.), and other. Second, we arranged a survey using the Google Form tool. The survey was sent to people with different backgrounds, including managers, marketing specialists, IT professionals, sales teams, financial analysts, and others, to gather diverse perspectives on data analytics' necessity and potential impact in their respective fields. The survey results are presented in **Appendix M**. Summaries of the interviews are provided in **Appendices G, I, and J**. We also conducted a personal interview with the owner of the BigData Team (BigData Team, n.d.), which provided advanced courses on data science and machine learning. The interviews are presented in **Appendix H**. Fourth; we met with Chinese company leaders and project managers to explore their demands in specific fields, especially in data analysis.

After having several discussions, we realized that developing IT courses by combining B2C services with actual case studies could benefit students by solving real problems in specific fields. The interviews are presented in **Appendix E**.

Secondary data is mainly associated with market analysis. To make market analysis, we analyzed competitors, the current situation in the ed-tech market, and Kazakhstan economics, evaluated and communicated with potential partners and corporate clients, and estimated the threat of substitutes. To evaluate competitors, we analyzed Hub Talks (Hub Talks #23, 2023), interviewing three owners of IT schools residential in Astana Hub. We used tools such as PESTEL and Porter's Five Forces to evaluate market conditions. Secondary data included articles and reports on Statistics (Bureau of national Statistics, n.d.), published research works of CompTIA State of the Tech Workforce (State of tech workforce 2024, n.d.), Enbek (Enbek.kz, n.d.), Head Hunter (HH, n.d.), and other reliable research works.

To elaborate on strategies that ProITivity can use, we collected all the information in the critical findings section. To prove an approach makes sense, we estimated the risks and benefits of each strategy and calculated break-even and NPV.

External and Internal Situation Analysis

Internal Situation Analysis

Company's Organizational structure

The company has two partners who contribute equally. One partner is responsible for the administrative part, while the other manages the academic side, including conducting courses. Both founders are graduates of Nazarbayev University, with one holding an FT MBA and the other a bachelor's degree in engineering. The instructor and the partner have extensive industry experience working for leading companies such as EPAM. (EPAM, n.d.), AltynAlmas (Altyn Almas, n.d.), and ERG (ERG, n.d.). Additionally, his transition into data analytics adds a relative perspective, inspiring students who aspire to make similar career shifts. There are only two employees: the CEO and an accountant. The company plans to hire an SMM (social media marketing) specialist and a targeting specialist.

Company's financial performance

The current organizational structure reflects the company's straightforward financial performance. A total of 46 students are being taught over seven months. The first group consisted of 19 students, of which 11 received grants of 600,000 KZT for seven months, while the remaining students were provided with internal grants and were taught for free. The second group consisted of 27 students, 13 receiving government and seven internal grants, while the rest received approximately 50% discounts. Despite the company generating positive returns,

these discounts and internal grants have resulted in a revenue shortfall from discounts and internal grants that is almost double the earnings (EBIT of 12 million KZT, potential revenue loss of 21 million KZT). This strategy helps acquire new customers and initially build brand awareness. The net profit is distributed equally between the two partners. For more details, please refer to **Appendix A**.

Current company's customers

Based on four interviews with current self-payees, ProITivity's clients aged 25 to 40 represent the primary audience for ProITivity's courses. These individuals:

- Encounter data analysis during their work or study and seek to enhance their efficiency and skills.
- Include professionals such as business analysts and statistics professors with minimal prior data analysis knowledge but are familiar with Excel.
- Are motivated by clear career goals, such as applying data analysis in their current jobs or transitioning into roles requiring these skills.

Key factors influencing their decision to choose ProITivity:

- Discounts, monthly payment options, and a low initial deposit (financial flexibility was the most cited factor).
- Practical and clear course syllabus, online learning formats, and mentorship opportunities.

- Proximity to Astana and responsive customer support.

Our survey indicates that 67,5% of respondents are willing to pay for a course if it covers their needs.

External analysis

External analysis is necessary to understand the business environment in which ProITivity must operate. Moreover, external factors define potentially beneficial or failed ways for business. We conducted two external analyses. The first is PESTEL, which describes the general business environment in which ProITivity operates. The second is Porter's five forces, which give clues about the leading market participants: competitors, customers, suppliers, substitutes, and newcomers.

1.1 PESTEL analysis

PESTEL is an analytical tool that identifies various factors affecting an organization's competitive standing. It examines political, economic, sociocultural, technological, environmental, and legal aspects. (Investopedia, n.d.).

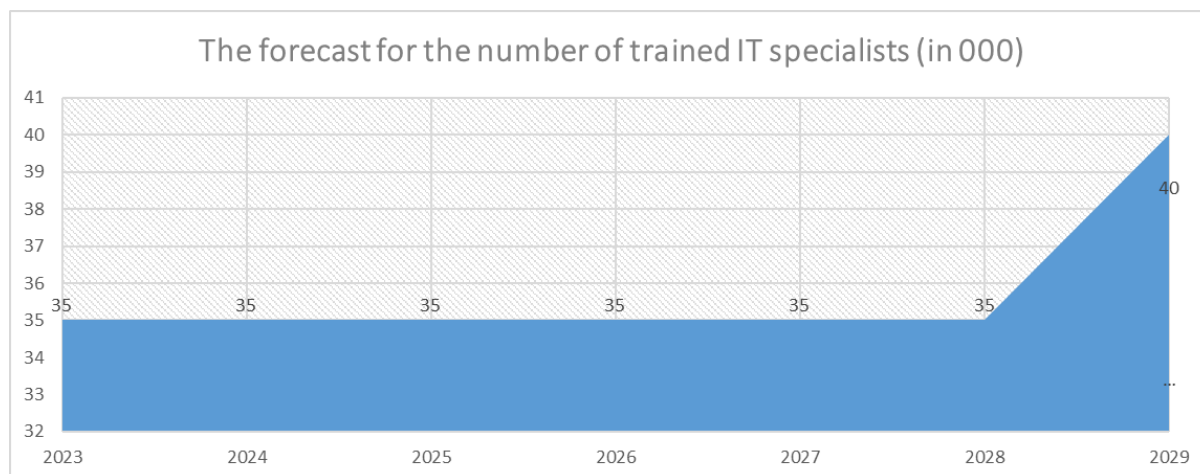
Political

100,000 IT specialists

In 2023, Kazakhstan implemented a program to prepare 100,000 IT specialists to shorten the demand for them by 2025. According to the Ministry of Digital Development, Innovations and Aerospace Industry of the Republic of

Kazakhstan (MDDIAI), the plan of 35,000 IT specialists is already met in 2023. The exact number of specialists should be graduated annually till 2028. In 2029, graduation should reach 40,000 people per year (Graph 1) (The ICT market of Kazakhstan. Status and development forecasts up to 2027)

Graph 1. The forecast for the number of IT personnel trained (in '000).



TechOrda program

The MDDIAI, in collaboration with the international technology park Astana Hub, launched the TechOrda program in 2021 with the intention of training 20,000 tech professionals by 2025. TechOrda's critical initiative plans to train over 3,000 tech specialists annually, with government support providing 600,000 tenge per student. According to TechOrda's inclusive rules (which are successfully met by schools), there should be a gender balance among students. In addition, no less than 45% of students from different regions should be for beginner courses and no less than 30% for advanced classes. (TechOrda's Programms, n.d.). This support from the government can affect the stable increase of the IT market and further investment in education.

Economical

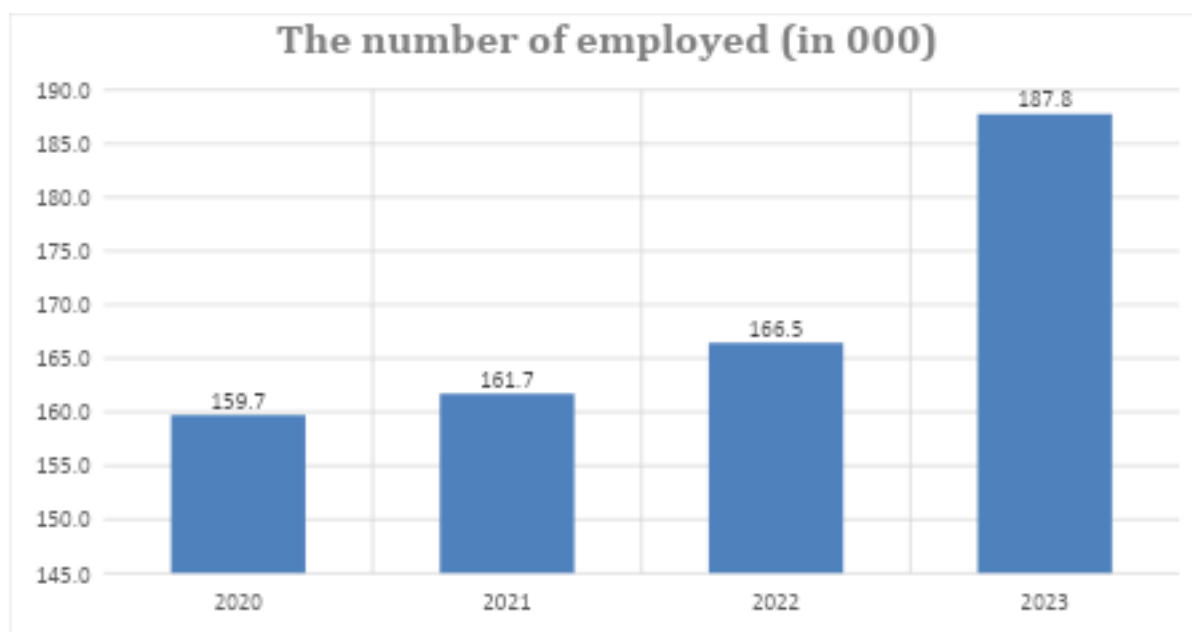
IT sector growth

Kazakhstan is actively increasing the export of IT services and products, aiming to reach \$1 billion by 2026. According to the ICT Market of Kazakhstan 2018–2027 report dated December 2023, the ICT market in Kazakhstan will continue to grow, with the annual growth in the IT services segment averaging 14.8% until 2027 (The ICT market of Kazakhstan. Status and development forecasts up to 2027). This creates additional opportunities for IT schools to offer courses in in-demand areas such as big data and data analytics.

Market supply & demand

According to the Bureau of National Statistics (BNS) of the ASPIR RK, in 2023, 187.8 thousand people of different specializations worked in the field of information and communications in the RK—12.8% more than in 2022 (Graph 2). Judging by the reports of 152.7 thousand companies, the number of IT specialists was 45 thousand people last year. Over the year, the indicator increased by 11.4% (45k in 2023, 40.4k in 2022).

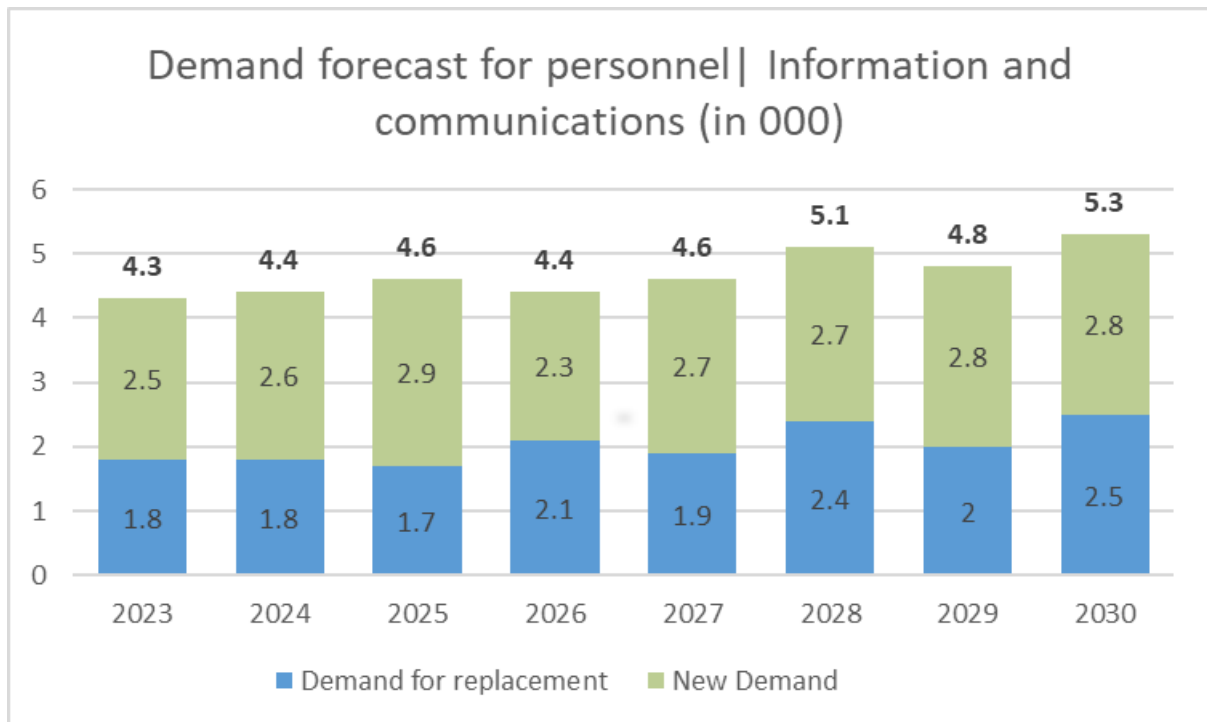
Graph 2 The number of employees in the IT sector (in 000).



As of April 19, 2024, 6.9 thousand resumes and 483 vacancies were posted on the Enbek.kz website in the IT and telecommunications sector. The option with the highest salary offers — from 700 thousand to 1 million tenge — are offered to 1C programmers, Big Data specialists, software developers, IT engineers, and system architects. The Russian recruiter HeadHunter (HH, n.d.) published announcements of 2.9 thousand vacancies in the IT sector of Kazakhstan. Employers seek analysts, programmers, developers, IT designers, and network engineers. They are ready to pay them from 500 thousand to 2 million tenge, depending on the position and length of service.

According to the calculations of the center's experts, the demand for specialists in this field will grow smoothly annually in Kazakhstan (Graph 3). The estimate for personnel is the following (000):

Graph 3 Demand forecast for personnel | Information and communications (in 000).

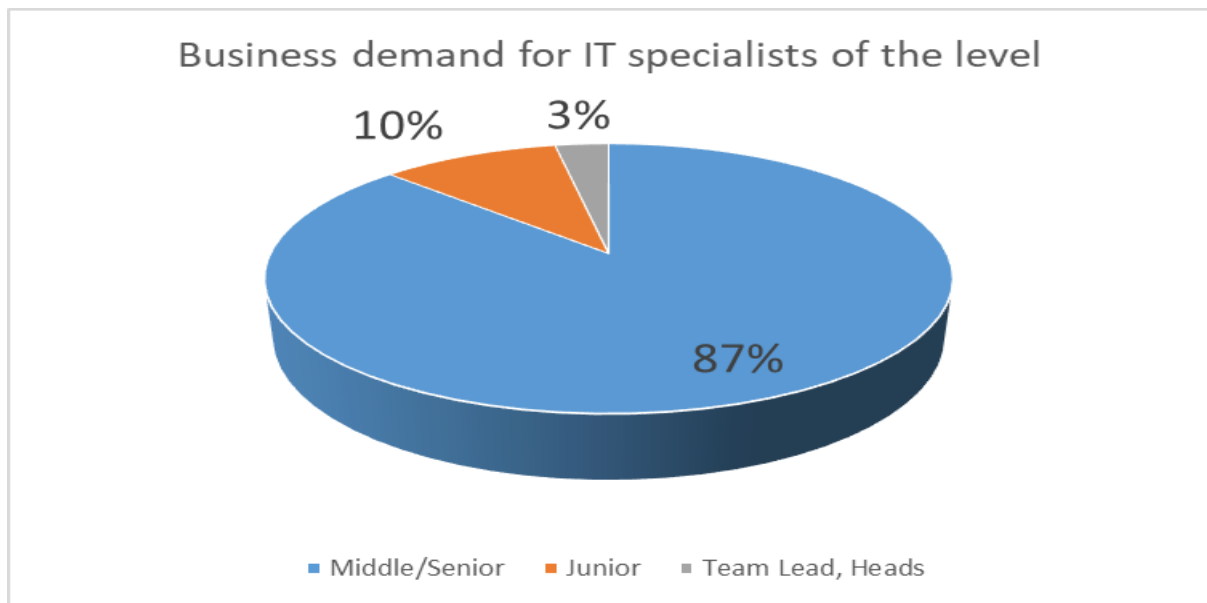


- New demand: This is the demand for new workers that arise due to economic growth or expansion within industries
- Demand for replacement: This is the demand for workers to fill positions vacated due to employee retirement or mortality.

Imbalance in the labor market

As per a survey launched in April 2024 by Digital Business with Software Cats and HH.kz, the highest demand is for middle/Senior students (Graph 4). (IT personnel market of Kazakhstan. Trends, problems, solutions -PDF, n.d.) (HH, n.d.).

Graph 4 Business demand for IT specialists of the level.

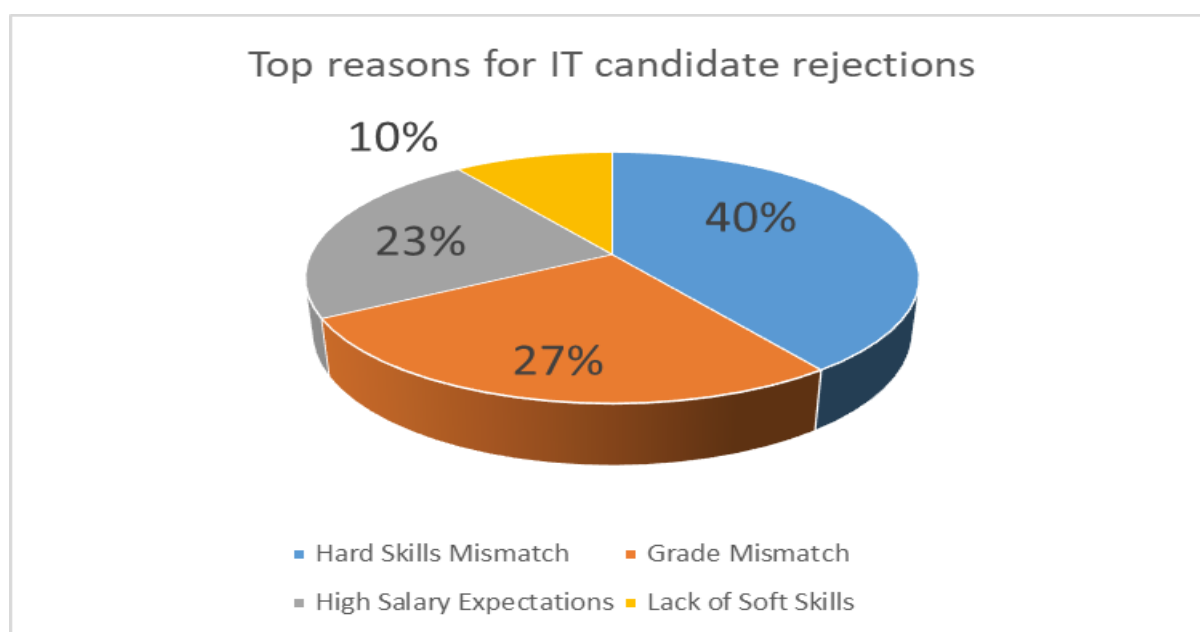


As per Islam Derbissalin (Appendix B), a junior specialist is someone who can handle commercial projects independently and manage standard tasks. Juniors should possess practical skills, such as working with IPs and handling basic tasks. This enables them to adapt more quickly to commercial projects. Middle specialists typically have more than 2-3 years of experience and the ability to solve complex problems and make technical decisions. Seniors have more than 5 years of experience and managerial skills.

According to recruiters' observations, employers are experiencing a shortage of experienced IT developers since the currently popular courses graduate specialists whose knowledge level is insufficient for full-fledged employment. Such changes in the ratio of juniors, middle, and seniors occurred against the backdrop of a drastic imbalance when, in 2022, many juniors began to graduate, thanks to government initiatives. At that time, a program appeared under which one could get a 100% discount on such education. This provoked a

huge influx of people into the positions of young IT specialists, which led to a highly demanding attitude of managers towards such juniors. (HH) As per communication with the Finance Program Director, Anarbek Utegenov, it is still a problem, as IT programs mainly target those who come from different backgrounds, such as accountants and teachers. Those who have already passed Junior level courses cannot be eligible for new grants. However, they can continue advanced courses within the same school. While IT schools can offer advanced courses, completing these does not automatically elevate a trainee to a middle or senior level, as these roles require substantial hands-on experience. Overall, the most common reasons for rejection of candidates are hard skills (40%) and grade mismatch (27%) (Graph 5).

Graph 5 Top reasons for IT candidate rejections.



Islam mentioned companies that offered successful courses with internships within the organization, such as 'Digital Summer' and 'Zhas Orken'

(ZhasOrken, n.d.) which were supported by Samruk-Kazyna (Samruk-Kazyna, n.d.) and provided both employment and training opportunities. Creating portfolios and implementing an assessment system for graduates, including tests on verbal and logical skills and project evaluations, would help employers better understand candidates' readiness. He considers that IT schools could incorporate local and global successful practices.

Sociocultural

Trends in IT education

Interest in IT specialties is increasing, especially among young professionals, and the education format's flexibility helps attract students. As per the AstanaHub publication in March 2023 (8 trends that define the IT market in Kazakhstan, 2023), the high interest in IT professions is due to high salaries, advanced learning programs, and the desire to work remotely. As per Antal's report, the average minimum of IT specialists starts from 300,000 KZT (Table 1):

Table 1 Antal's report of salaries.

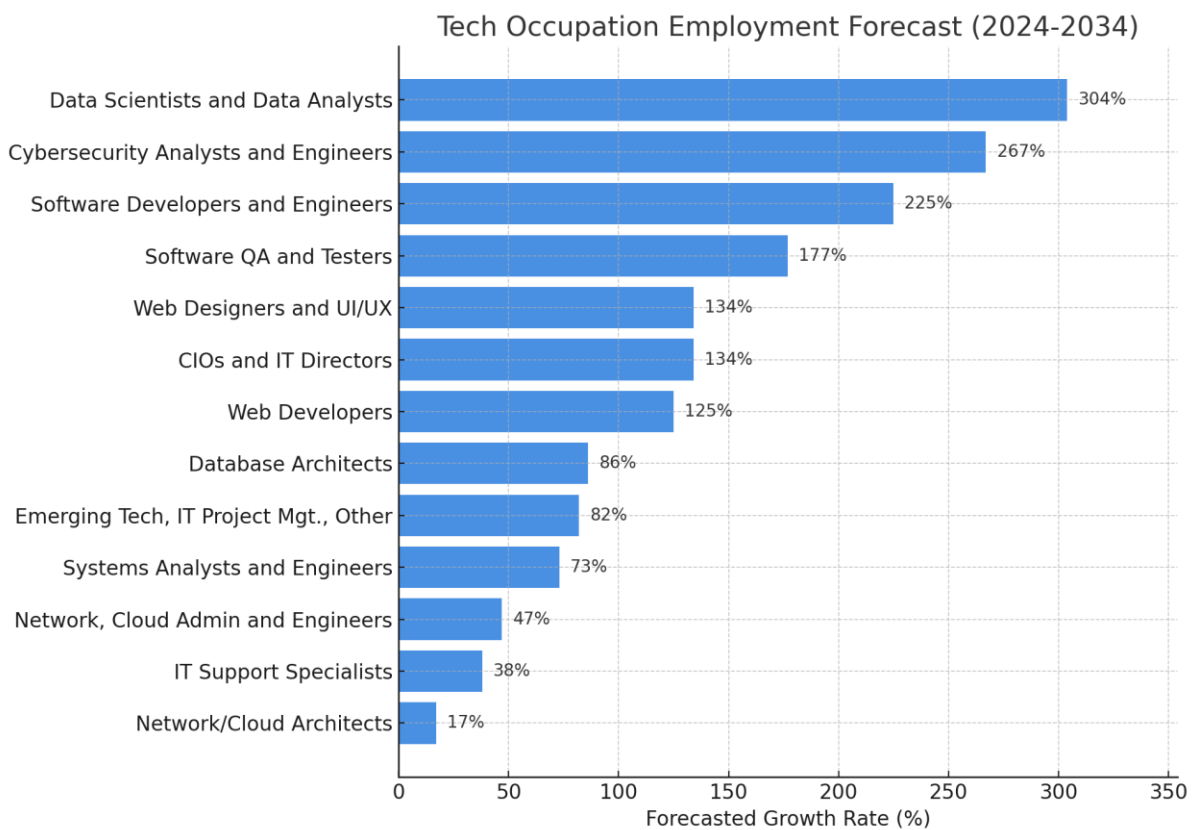
| Высшее руководство | Средний минимум | Средний максимум |
|---|------------------------|-------------------------|
| Генеральный директор/Исполнительный директор/Управляющий директор | 1 800 000 | 4 500 000 |
| Руководитель представительства | 1 500 000 | 3 800 000 |
| ИТ директор/Технический директор | 1 500 000 | 4 300 000 |
| Продажи/Развитие бизнеса | | |
| Директор по работе с ключевыми клиентами | 1 000 000 | 1 800 000 |
| Менеджер по работе с ключевыми клиентами | 700 000 | 1 500 000 |
| Директор по работе с партнерами | 1 100 000 | 2 500 000 |
| Менеджер по работе с партнерами/Менеджер по дистрибуции | 700 000 | 1 500 000 |
| Продажи/Развитие бизнеса | | |
| Junior разработчик | 300 000 | 500 000 |
| Middle разработчик | 600 000 | 900 000 |
| Senior разработчик | 1 600 000 | 2 200 000 |
| Мобильные разработчики | 656 000 | 1 400 000 |
| Менеджмент | | |
| Руководитель ИТ-проектов | 1 000 000 | 2 000 000 |
| Project Manager | 700 000 | 1 800 000 |
| Системный аналитик | 800 000 | 1 600 000 |
| Бизнес аналитик | 700 000 | 1 400 000 |
| Специалист техподдержки | 500 000 | 800 000 |
| Тестировщик | 500 000 | 1 400 000 |
| Дизайн | | |
| UX/UI дизайнер | 450 000 | 1 200 000 |
| Гейм-дизайнер | 500 000 | 1 300 000 |
| 1С | | |
| Senior 1С разработчик | 1 200 000 | 2 000 000 |
| 1С ERP разработчик | 1 100 000 | 1 800 000 |
| Middle 1С разработчик | 900 000 | 1 500 000 |
| Junior 1С разработчик | 500 000 | 700 000 |

Trends in IT in the US and worldwide

According to CompTIA Research, published in March 2024, the macro trend of digital transformation means that demand for tech talent across the full spectrum of tech job roles will continue to grow. The trend growth reflects the ongoing digital transformations occurring across the economy and the corresponding need for expertise in data analytics, cybersecurity, software development and application integration, and process automation (Graph 6).

Over the next 10 years, tech occupation employment is expected to grow at about twice the rate of overall jobs across the economy. The highest growth is for data scientists and analytics professionals, up to 304% (State of the Tech Workforce 2024, n.d.).

Graph 6 Tech Occupation Employment Forecast (2024-2034).



Technological

Kazakhstan is actively developing its IT sector, supporting initiatives like TechOrda to increase IT service exports to \$1 billion by 2026, which opens opportunities for educational companies in areas such as big data, machine learning, and data analysis. ProITivity primarily uses an online learning format,

allowing students to study from anywhere in the world, aligning with the global trend towards distance education that the COVID-19 pandemic and the rise of online platforms like Coursera and Google (Google, n.d.) have strengthened. Additionally, the tech sector is increasingly focusing on process automation and data analytics, providing opportunities for the company to develop new courses in areas like machine learning, artificial intelligence, and other advanced technologies.

Environmental

Within data analytics courses, it would be beneficial to offer specializations related to environmental data analysis and sustainable development, attracting students interested in ecology and sustainable growth. For instance, in Almaty, the initiative AirKaz.org installs sensors to collect air pollution data, which requires professional analysis. This area could become significant in ProITivity's educational programs, as analyzing such data will aid in developing strategies for improving the environmental situation and monitoring air quality. Considering Kazakhstan's rich traditional energy resources, focusing on transitioning to renewable energy sources could also be part of discussions in data analytics. The analysis of data from air pollution sensors would contribute to developing effective solutions for moving toward cleaner energy sources and reducing environmental impact.

Legal

Astana Hub participants

Astana Hub participants take advantage of a preferential tax regime having the following tax exemptions: corporate tax, personal income tax, and value-added tax on the turnover of goods, works, and services sold in Kazakhstan. Tax preferences apply only to those participants who carry out activities within the framework of priority activities, by the List approved by the Order of the Minister of Digital Development, Defense and Aerospace Industry of the Republic of Kazakhstan dated April 11, 2019, No. 37/NK. Simplified visa and labor procedures: Foreign teachers and specialists can work in the Hub with simplified visa and labor conditions, which promotes the exchange of knowledge and experience. Government regulations and accreditations for IT schools influence the formation of programs and courses (Table 2).

Table 2. Tax benefits of Astana Hub.

Tax benefits of Astana Hub

| Astana Hub participants | | Without benefits |
|---|----|------------------|
| CIT | 0% | 20% |
| VAT on sales of GWS (Goods, works, services) | 0% | 12% |
| VAT on imports according to the list of goods | 0% | 12% |
| VAT on the purchase of services from non-residents | 0% | 12% |
| IIT from the income of resident employees | 0% | 10% |
| Dividends | 5% | 15% |
| Social tax for foreign workers | 0% | 9.5% |

(List of priority activities in the field of information and communication technologies, 2023) (Become a participant of Astana Hub and receive tax preferences, n.d.)

1.2 Porter's Five Forces

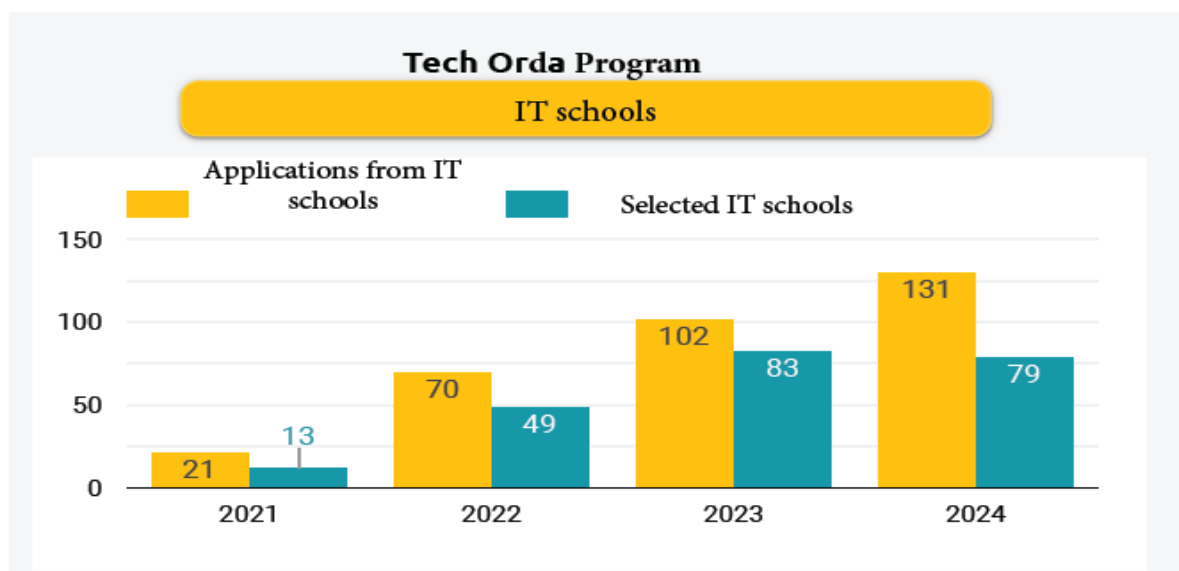
Porter's Five Forces is a tool for assessing the competitive dynamics in an industry by examining five key areas: competitive rivalry among existing players, the threat of new entrants entering the market, the bargaining power of suppliers in setting prices or quality, the bargaining power of buyers to demand lower prices or better offerings, and the threat of substitutes from alternative products or services. Together, these forces help organizations understand industry

pressures, determine profitability potential, and develop strategies to strengthen their competitive position. (Investopedia, n.d.)

Threat of New Entries: High

The entry barrier is **low** due to the simplified registration procedure in Astana Hub and governmental support with programs such as TechOrda. There are more than 1,400 IT companies registered in the Astana Hub. The creation of new educational platforms and startups is stimulated by access to tax incentives and acceleration programs. However, there is increased competition among new players. The participants in TechOrda increased by 45.7%, amounting to 102 organizations, and registered IT schools increased by 69.4%, amounting to 83 in 2023. As for the first half of 2024, an additional 79 IT schools are registered out of 131 applications (Graph 7).

Graph 7. Selected and applied to IT schools (in 000).



Bargaining Power of Suppliers: Relatively limited

Instructors and trainers

Nowadays, many people who have an IT background can become instructors due to plenty of affordable IT courses. In Kazakhstan, the fees for IT teachers instructing data analysis courses vary based on factors such as course level, teaching experience, and the institution. Experienced IT and data analysis specialists are expensive. The average salary is about 420 thousand KZT (HH).

Technology platforms

Video communication and classroom platforms such as Zoom and Google Meet, as well as Learning Management Systems (LMS), play important roles in organizing the learning process. However, their impact on ProITivity is limited, as there are many similar solutions available on the market. This allows you to choose the most cost-effective options.

Suppliers of educational materials

Most of the content is developed by the ProITivity school itself, which reduces dependence on external material suppliers. This gives the company more control over the cost of creating courses and minimizes suppliers' impact on the educational process.

Bargaining Power of Buyers: High

Students

Consumers can be divided into two groups: those who pay for education and those who study on grants. The typical granted students are under 30 years old and want to switch careers. They decided to study data analysis because it is popular and accessible. They chose ProITivity because this school accepted them.

This portrait is usual for other Astana Hub residents. Based on the interview with Hub Talk (Hub Talks, 2023), the typical TechOrda beginner student is around 24 years old, often a career switcher, and requires significant support during their learning process.

The students granted have weak motivation (general education, following educational trends) and don't have a clear plan for what they will do after graduation.

On the contrary, consumers who pay for education choose courses based on quality, reviews, and career opportunities that the program provides. The demand for affordable and flexible programs is incredibly high. It forces IT schools, especially those that want to continue operations after TechOrda terminates, to adapt to market demands and actively cooperate with companies to employ graduates. After the TechOrda program terminates, the school should rely on more motivated students who have a clear vision and understand why they need this education.

Threat of Substitution: Moderate

Online courses and certifications from the leading players like Coursera, and Google stay as the main threat of substitution. Below in the Table 3 is the general information of courses on Coursera. Detailed descriptions of courses are in Appendix K.

Table 3 Distribution of Online Courses by Type and Pricing.

| Course Type | Number of Courses | Minimum Price (USD) | Maximum Price (USD) |
|---------------------|-------------------|---------------------|---------------------|
| Beginner's Course | 1970 | 49 | 79 |
| Intermediate Course | 1262 | 49 | 99 |
| Mixed Course | 326 | 39 | 89 |
| Advanced Course | 139 | 99 | 149 |

As per a survey we initiated, about 39% of respondents studied courses on data analysis using online platforms like Coursera, Udemy, etc. Meanwhile, the threat from this site is not powerful enough because courses on platforms don't have tutors, they usually lack real-based cases, and they don't provide peer collaboration. Thus, ProITivity could have more advantages.

Research (Deranty, JP., Corbin, T. , 2024) shows that while AI and online platforms can automate routine tasks, they cannot fully replace human analysts, especially in tasks requiring creativity and critical thinking. The article (Yang, W., Wei, Y., Wei, H. et al. , 2023) also notes that AI often requires human intervention to interpret results in complex scenarios.

Rivalry among Existing Competitors: High

75 IT educational companies are TechOrda residents. Some teach basic data analytics, and others target customers with advanced data science, data engineering, programming, and product design courses. IT education institutions, including Academica (Academica, n.d.), BigData Team (BigData Team, n.d.),

Outpeer (Outpeer, n.d.), nFactorial School (nFactorial, n.d.), DataBoom (Databoom, n.d.), and Sergek Academy (Sergek Academy, n.d.), are the main competitors of ProITivity in the Kazakhstani market because of their long success history. Every one of these institutions provides a diverse range of courses aimed at various student demographics, ranging from novices to experts. Detailed description of competitive schools with prices, advantages, and disadvantages is in **Appendix L**.

Strategies competitors apply

Nowadays, the B2C market for IT education faces several opportunities and challenges. Some rely on scholarships, some on business partnerships, and some even provide discounts to self-funded students. Competitors use different pricing methods to meet the needs of different groups of students.

Relatively low barriers to entry intensify this rivalry, thanks to support from Astana Hub and programs like TechOrda, which encourages new participants, particularly in fundamental data analysis and programming courses.

Summary of Internal and External Analysis.

Based on the PESTEL analysis and Porter's five forces, the following conclusions can be drawn for the ProITivity School:

The government creates incentives for IT schools. Society and economics also greet a growing number of IT specialists. However, competition in the IT education sector in Kazakhstan is high, as many players offer courses at various levels, from fundamental data analysis to advanced machine learning. Low

barriers to entry, supported by benefits and programs like TechOrda, have led to an increase in the number of market participants, which increases competition. At the same time, educational platforms with similar content and capabilities make the market saturated and multivariate, and the availability of alternative online courses on international platforms such as Coursera and Google also limits the growth potential. ProITivity has several advantages over substitutes and competitors, such as discounts, monthly payment options, mentorship opportunities, proximity to Astana, and a low initial deposit (financial flexibility was the most cited factor).

Survey, Interview Results, and Overall Key Findings

Survey results

Based on responses from over 100 participants, the survey results highlight the growing importance of data analysis skills in professional and personal contexts, with 87.3% of respondents recognizing their value. Despite this high demand, data analysis is still at an early integration stage for many, as most respondents use these skills infrequently. The findings emphasize the need for targeted educational solutions that address key challenges, such as the lack of practical experience and support while catering to diverse learning preferences.

The following key findings and insights were identified based on the survey results.

High Interest: There is a strong demand for data analysis skills, especially among professionals in the business and finance sectors.

Practical Gaps: A critical need for hands-on training and real-world applications to overcome learning barriers.

Preferred Formats: Hybrid models combining live sessions and self-paced learning are highly favored.

Advanced Topics: Popular subjects include advanced data analysis, artificial intelligence, and business analytics.

Price Sensitivity: Flexibility in pricing and value additions like certifications can significantly influence willingness to pay.

Based on our analysis, we can determine the pros and cons of ProITivity's continuing its current business model of offering basic data analysis online courses after the termination of the TechOrda program and provide strategic recommendations for its future growth and sustainability in a competitive market.

The Importance of Practical Experience and Internships

Based on external economic analysis, only practical, experienced IT workers are recognized as middle or senior specialists; thus, getting experience plays a key role in IT education. By creating opportunities for internships, ProITivity can provide students with real-world industry experience. Based on our survey, 56% of respondents require more real-based cases for practices. 17% are seeking help in employment. One interviewee noted, *"Many courses may teach something that has no application in real life."* Datasets, source codes, and **case studies must be down to earth.** One weakness of IT courses is the artificiality of tasks. One of the interviewees shared his thoughts about this:

“Many courses may teach something that has no application in real life. Such material is difficult to remember. I notice a problem among people in my industry (IT) of not understanding the actions they perform”.

22% of respondents appreciate the instructor's expertise. Ensuring that instructors have professional certifications and rich experience will also increase the credibility and attractiveness of the courses.

Course improvement

In-Depth and Adjacent Lectures:

- 29% of respondents requested more detailed lectures.
- 26% desired lectures on adjacent topics like finance, marketing, statistics, and math, reflecting diverse IT knowledge needs.

Communication and Support:

- 12% of respondents emphasized the importance of communication between students.
- 17% sought gamification elements and mentorship for better engagement and support.
- 20% of respondents do not understand what results they must obtain at the end of data analysis.

Growing Demand for Data Analysis Courses

The demand for data analysis is expected to rise significantly in the coming years. Interviews with various companies, including startups, SMEs, and international businesses, have also shown a strong need for data analysis skills

across industries. Also, in our survey, 87% of respondents are either studying or interested in learning data analysis. Reasons include personal development, a better understanding of business processes, and the increasing demand for this skill. Data analysis quickly becomes a core skill, like learning English or basic literacy, proving its high value in education today. Therefore, continuing with current courses will help ProITivity strengthen its role in shaping the future workforce.

In addition, Astana Hub remains an active part of the IT ecosystem, offering tax incentives and various forms of support to registered schools. These policies create a more favorable and profitable environment for ProITivity, even after the TechOrda program ends. See detailed information in Appendix D.

Challenges from Competitors and Market Saturation

The IT education industry also faces significant challenges. The TechOrda program has led to the growth of many IT schools, resulting in intense competition. Some schools, like BigData Team and Outpeer, have built strong reputations, allowing them to reduce marketing costs. Others, like DataBoom, rely heavily on large advertising budgets and aggressive promotion strategies to stay competitive. Moreover, Astana Hub's support has lowered the industry's entry barriers, increasing the threat of new competitors. These new entrants may quickly gain market share through strong financial backing, effective marketing strategies, or existing customer bases. Online platforms like Coursera, Udemy, and Udacity also offer a wide range of pre-recorded courses. While these lack

personalized feedback, they attract students with low costs and flexible schedules, posing another challenge to ProITivity.

Challenges from potential clients

Some interviewees mentioned an inflexible schedule due to online classes with instructors. Students noted that pre-recorded videos would be more convenient for them.

Strategies for Marketing and Leveraging Alumni Networks

Given these factors, ProITivity must invest considerable effort to survive and thrive in this highly competitive landscape. Strategic online presence and advertisement require substantial investments in marketing. Aggressive marketing, in particular, demands a significant amount of money to be effective. The best channels for advertisement are context ads in Yandex and Google research systems and target ads in social media. As of 2024, approximately 23% of the country's population are Instagram users in Kazakhstan. The most active age group is between 18 and 34, making up over half of Instagram's user base (htt5). However, focusing on building a reputation through word of mouth is less costly, while it is a very time-consuming and effort-intensive process.

Brand awareness helps to increase trust in a company and diminish marketing expenditures on ads. Brand trust stems from incorporating human values and principles into interactions rather than focusing solely on corporate goals (Gorbatov, Khapova, & Lysova, 2018).

Given the founders' background from Nazarbayev University, they can leverage resources from the university's alumni network for B2B marketing. By utilizing successful past experiences and connections, the founder can tap into more business cooperation opportunities, foster growth through established relationships, and enhance the credibility of the business in the corporate sector.

Based on the key findings above and competitors' different strategies, we evaluate several business development strategies after the TechOrda program terminates. For each strategy, we evaluated risks and benefits and calculated NPV. Based on these tools, we recommend the following go-to-market strategies:

Strategy I. Remain the same product.

Strategy II. Update the current product to more advanced.

We describe these two strategies below. We provide some of the rejected strategies that are less beneficial, either in financial or resource-consuming terms, in the Appendices.

Strategies and General recommendation

Strategy I. Remain the same product.

In this strategy, we recommend keeping the actual product - basic data analysis skills for everybody.

Marketing strategies

ProITivity can apply two marketing strategies. The first one is aggressive marketing. Table 4 presents a systematic comparison of the risks and benefits of aggressive marketing.

Table 4 Common risk and benefits of aggressive marketing.

| Aspect | Risks | Benefits |
|------------------------------|---|---|
| Market demand | - Saturation of basic data analysis courses in the market creates high competition. | - Consistent demand for data analysis skills across industries and job functions ensures a steady stream of potential students. |
| Cost of Customer Acquisition | - Aggressive marketing requires substantial upfront investment with uncertain ROI. | - Targeted marketing efforts can lead to long-term brand recognition and customer loyalty. |

| | | |
|-------------------------|---|--|
| | <ul style="list-style-type: none"> - Reliance on discounts to attract customers impacts revenue margins. - word-of-mouth approach is time-costly. | |
| Revenue generation | <ul style="list-style-type: none"> - Dependence on discounts and affordability concerns among the target audience reduces potential revenue per student. - High competition drives price sensitivity. | <ul style="list-style-type: none"> - Streamlined product offering minimizes operational complexity, reducing per-student costs in the long run. |
| Operational Feasibility | <ul style="list-style-type: none"> - High resource consumption to implement aggressive marketing. | <ul style="list-style-type: none"> - Leveraging existing experience and networks reduces the learning curve for execution. |

| | | |
|-------------------|---|--|
| | <ul style="list-style-type: none"> - Resource-intensive effort to create outstanding courses and feedback mechanisms. | <ul style="list-style-type: none"> - Potential to build a strong alumni network for referrals. |
| Scalability | <ul style="list-style-type: none"> - Limited scalability if dependent on in-person elements or slow word-of-mouth growth. - Requires extensive initial investment to scale marketing efforts. | <ul style="list-style-type: none"> - Online course delivery format offers inherent scalability without geographical limitations. |
| Brand Positioning | <ul style="list-style-type: none"> - Strong competitors in the market could overshadow ProITivity's offerings if differentiation is insufficient. | <ul style="list-style-type: none"> - Opportunity to build a recognizable brand through quality courses and personalized feedback. |
| Sustainability | <ul style="list-style-type: none"> - Long-term financial viability threatened by reliance on price- | <ul style="list-style-type: none"> - Maintaining a singular focus on core offerings ensures streamlined |

| | | |
|--|---|--|
| | sensitive students and heavy marketing investments. | operations and sustainable quality improvements. |
|--|---|--|

Quantitative Analysis

To prove our strategy, we conducted a Break-even point and Net Present value analysis. Here, you can find calculations that might be helpful in decision-making. To see the Break-even point for the strategy with aggressive marketing, we focused on marketing and sales managers' expenses; our assumption regarding the salary of a tutor is the same that now, that tutor will share the Net Income with the founder, calculated salary in fixed cost will go only to mentor, who will check homework and give feedback to students. Regarding the break-even calculation, we found out that 24 clients per month will allow ProITivity to cover costs. NPV analysis of the first strategy in 5 years gives promising results in 3.3 mln. KZT. (Appendix P).

The second marketing approach is offering courses on data analysis for corporate clients. There is demand for data analysis in different industries, from governmental sectors to SME companies. Table 5 presents the risks and benefits of this strategy.

Table 5 Common risk and benefits of the marketing approach

| Aspect | Risks | Benefits |
|--------------------|--|---|
| Market demand | <ul style="list-style-type: none"> - Market penetration may be slow initially - Requires strong networking and trust-building in the corporate sector | <ul style="list-style-type: none"> - High demand across various industries (government, SMEs, corporates) - Opportunity to target businesses seeking data-driven decision-making |
| Revenue generation | <ul style="list-style-type: none"> - Initial revenue may take time to materialize due to longer sales cycles - Dependence on securing contracts from larger clients or tenders | <ul style="list-style-type: none"> - Potential for long-term, high-value contracts with corporate clients - Opportunity for recurring revenue through training sessions and workshops |
| Scalability | <ul style="list-style-type: none"> - Limited by the company's internal resources, such as trainers, course | <ul style="list-style-type: none"> - Ability to scale through partnerships and repeat business |

| | | |
|--------------------|--|--|
| | customization, and infrastructure | - Opportunity to expand to different industries as the program grows |
| Brand Positioning | <ul style="list-style-type: none"> - High competition from established corporate training providers - Challenging to differentiate in a crowded market | <ul style="list-style-type: none"> - Enhances ProITivity's reputation as an expert in corporate data training - Creates credibility by partnering with recognized companies |
| Client Acquisition | <ul style="list-style-type: none"> - Requires significant effort in outreach, cold calling, and marketing - Risk of low conversion rates if marketing and sales efforts aren't optimized | <ul style="list-style-type: none"> - Ability to leverage existing relationships (alumni, business networks) for introductions - Potential for referrals from satisfied clients |

Quantitative Analysis: Cost-Benefit Calculation

The break-even point in the case of offering courses for corporate clients would be at the end of 24 clients. And NPV for corporate clients would be 3.8 mln. KZT. (Appendix Q)

Recommendations

Product recommendations.

- The process of study should be modified to be more practical. To enrich the course with actual project tasks, owners of ProITivity can address different companies to gain cases. It requires time, a vast network, and, sometimes, money because companies can ask for payment for commercial data.
- The main lectures should be recorded to save teachers time and resources and to give students schedule flexibility.
- The school's mentors should provide students with more detailed and regular feedback to avoid misunderstanding.

Aggressive marketing recommendations.

- Develop context (in Google and Yandex search systems) and target (in social media) advertisement.
- The ads can be allocated to social media. For Kazakhstan, it is better to use Instagram (for young and middle ages) and TikTok (for younger generations).

- Build departments of marketing and salespersons who contact potential clients and offer courses.
- Regularly arrange offline and online events to be notable and famous,
- Extend the product line to provide upsells, down sells, cross-sells, and tripwires.
- Additionally, we strongly recommend developing brand awareness through the personal brand of one or both founders to make the school more personal, drawing attention and building trusting relationships with its audience. It can be done by developing personal accounts on social media.

Corporate sales recommendations

Target Market Identification

- **Small and Medium Enterprises (SMEs):** Approach SMEs struggling with automatization or data-driven decision-making.
- **Corporate Education Department (e.g., EY Academy (EY Academy, n.d.)):** Collaborate with corporate education departments with a budget for employee training.

Sales Approach

- **Tenders:** Find and participate in tenders for data analysis training.
- **Network:** Reach corporate clients using networks, including ProTivity students and graduates. Encourage referrals.
- **Cold Calling and Outreach:** Use cold calling to contact companies that may benefit from data analysis training.

- **Webinars and Showroom Presentations:** Organize educational webinars and showroom events to show ProITivity's expertise and capabilities in solving companies' challenges with data analysis.

Long-Term Relationships and Continuous Engagement

- **Periodic Showroom Events:** Organize constant showroom events to update clients on the latest data analysis trends and ProITivity's evolving offerings.
- **Corporate Education Plans:** Work with companies to create long-term training plans that align with their business goals, ensuring that their teams stay competitive in the market.

Strategy II. Update the product so it teaches from the beginning to strong juniors

Our analysis showed that there is high demand for middle and senior specialists. However, the advanced courses do not cover this demand, as the middle and senior level requires practical experience. To solve this issue ProITivity can enforce its course to make its students graduate with a Strong Junior level. This strategy can be developed in two ways. The first is to redesign the course to an advanced level where alumni will be more trained with deeper knowledge using **real cases study**. The second is to provide an **internship after graduation**. Both ways allow ProITivity to remain the same product and create unique value for customers. The purpose of the course redesign is to make alumni

more trained and adapted to solve real work problems; to make alumni more experienced in working with data.

Table 6 Common risk and benefits of the second strategy

| Aspect | Risks | Benefits |
|--------------------|---|--|
| Market Positioning | <ul style="list-style-type: none"> - Higher competition from advanced IT education providers offering developed advanced courses and internship programs. - Risk of failing to stand out in a crowded market. | <ul style="list-style-type: none"> - Enhanced course offering improves ProITivity's market reputation and credibility. - Unique value proposition attracts a committed student base. |
| Development Costs | <ul style="list-style-type: none"> - High initial investment required to redesign and enrich course content. - Costly to prepare real-world datasets and establish industry partnerships. | <ul style="list-style-type: none"> - Modular, in-depth courses can justify higher pricing and increase revenue per student. - Long-term cost efficiency once content is developed. |

| | | |
|------------------------------|--|--|
| Operational Complexity | <ul style="list-style-type: none"> - Increased effort needed to manage and update multiple course modules and ensure consistency across topics. - Reliance on qualified mentors for hands-on guidance. | <ul style="list-style-type: none"> - Flexible payment options enhance engagement and attract diverse learners. |
| Revenue Potential | <ul style="list-style-type: none"> - Requires effective marketing to justify higher course fees. - Deferred payment models may delay revenue realization. | <ul style="list-style-type: none"> - Higher pricing for advanced, real-world training can lead to increased profit margins. - Potential for upselling modules or certifications. |
| Branding and Differentiation | <ul style="list-style-type: none"> - Risks of being overshadowed by well-established global competitors in advanced IT training. | <ul style="list-style-type: none"> - Improved student outcomes enhance ProITivity's image as a provider of quality education. |

| | | |
|--|--|--|
| | - Difficulty building a unique identity in a saturated market. | - Alumni success stories contribute to long-term branding. |
|--|--|--|

Table 7 Common risk and benefits of Real-based advanced courses

| Aspect | Risks | Benefits |
|------------------|---|---|
| Scalability | <ul style="list-style-type: none"> - More complex course structure increases operational and technical requirements. - Requires significant resources for live mentoring and updates. | <ul style="list-style-type: none"> - Pre-recorded modular content offers scalability with minimal additional costs. - Hybrid models can cater to diverse student preferences. |
| Student Outcomes | <ul style="list-style-type: none"> - Risks of failing to deliver real-world readiness, leading to low employment rates and dissatisfaction among graduates. | <ul style="list-style-type: none"> - Strong junior-level graduates are more employable, leading to better word-of-mouth promotion and brand loyalty. |

| | | |
|--------------------|---|--|
| Student Engagement | <ul style="list-style-type: none"> - Complex content may overwhelm students without proper guidance. - Real-world projects require close monitoring and high-quality mentoring. | <ul style="list-style-type: none"> - Offers rich, in-depth content that attracts serious learners. - Real-world cases that align with the specific industry needs boost engagement and learning outcomes, improving course completion rates. |
|--------------------|---|--|

Table 8 Risk and benefits of Internships After Graduation

| Aspect | Risks | Benefits |
|------------------------|--|---|
| Corporate Partnerships | <ul style="list-style-type: none"> - Establishing an internship requires time, resources, and relationship-building efforts. - Quality and consistency of internship experiences may vary. | <ul style="list-style-type: none"> - Partnerships provide real-world exposure, increasing student employability. - Strengthens relationships with companies, potentially leading to more B2B opportunities. |

| | | |
|------------------------|---|---|
| Real-World Application | <ul style="list-style-type: none"> - Reliance on companies to offer meaningful tasks might lead to variability in student experiences. | <ul style="list-style-type: none"> - Direct hands-on experience through internships builds practical skills. - Students graduate with portfolios and industry-relevant experience. |
| Revenue Generation | <ul style="list-style-type: none"> - Revenue (generated from students) may be delayed or dependent on the success of internship placements. - Potential operational costs for managing internship programs. | <ul style="list-style-type: none"> - Generates revenue through provision of additional services involving students. - Provides additional value to companies, encouraging long-term partnerships. |

Quantitative analysis

Break-even point for strategy adding more real-based cases is 35 clients. In this strategy ProITivity should hire not only mentors, also case designers who will create real based cases for different industries according to the demand identified during the survey that we conducted and the approximate cost for them

would be 1 mln. KZT as per the senior data consultant. NPV for this strategy is 25.8 mln KZT.(Appendix R)

Recommendations

Based on the analysis, developing real-world cases can be more expensive and riskier in terms of failing to deliver real-world readiness, leading to low employment rates and dissatisfaction among graduates than an internship program. The cost of purchasing data varies depending on the industry and the volume of information. However, such cases may not always align with the needs of industry-specific courses. Providing data analysis or other services, where BI instruments are used, could help in developing real-world cases while also offering students internship opportunities within the company. This approach has proven successful for other schools.

Provide Internships Through Service Provision:

- Partner with companies to offer short-term or long-term data analysis / other services involving other BI tools where students can work on real projects as part of their education.
- These projects can involve solving actual business problems in data analysis, helping students gain hands-on experience while delivering value to the client companies.
- Structure internships as part of the curriculum to integrate learning with practical application.

- Use internship projects to build a library of real-world case studies for future cohorts.
- Create portfolios and assessment systems, including tests on verbal and logical skills, successful closed cases
- Leverage Outsourcing as a Revenue Stream generates income from services by involving student analysts and reducing reliance on grants.

Long-term relationships:

- **Peer forums**, building alumni networks to connect learners and provide continued value. Alumni **can act as ambassadors** of the course for their colleagues and attract new students to the school.

Quantitative analysis

Taking into account the fact that ProITivity can partially cover the demand of outsourcing data analysis via partnering with companies who are searching for data analysis and giving opportunity to their students in practicing. This partnership can give about 30% of revenue generated by students (approximately contract sum would be 2.8 mln. tenge) and reduce the case designer expenditures. So for Break-even analysis we found out that 24 customers will be enough to cover the costs and 36 mln. KZT of NPV of the project which is still the highest number among others strategies (Appendix S).

Conclusion

Thanks to modern technologies, big data has become an integral part of every business process. This means that basic data analytics skills are essential for everyone, even for those not directly involved in the IT industry. The survey and external analysis research prove this thesis and showed that there is huge demand on data analytics among Kazakhstan people. Thus, learning the basic data analytical skills will be actual and ProITivity can continue its business even after TechOrda program termination.

To satisfy growing demand on data analytical skills we recommend continuing the same course with a little product improvements such as pre-recorded videos and adding more practical tasks. Additionally we advise adding courses on financial reporting and analysis based on the results of our survey and conducting interviews with successful IT schools (Appendixes B and M).

The strong advantage of this strategy is that ProITivity's founders shouldn't change the product, so they can save money and time on elaborating a new product. To make ProITivity's business model more sustainable after Tech Orda termination we recommend to follow one of the marketing strategies: aggressive marketing or corporate education. Based on analysis of competitor's strategies the most sustainable and reliable way is to develop both marketing ways. It requires extensive investments in the very beginning. However, the examples of successful competitors reveal that this strategy could be very financially rewarding in future.

Growing demand in the labor market for experienced IT specialists gives ProITivity an idea to develop another strategy - providing a course that will teach data analysis from beginning to strong junior level. The main thing that ProITivity founders should do is upgrade the product to advanced courses by real-based cases or provide internships for the most aspiring students. Both ways are time consuming and require an extensive network. However, if ProITivity can enrich its product with real-base cases or internships it will definitely provide a unique value proposition to the Kazakhstani EdTech market.

Another advice is to set the analysis of launching the new course for Artificial Intelligence, due to 45% answers from respondents the increasing interest in artificial intelligence.

Before going abroad ProITivity should establish sustainable business in Kazakhstan. They have to gain financial stability and create a strong, reliable team. Creating courses on global platforms like Coursera or Udemy also is not a good choice without strong accreditation and English-language videos.

Bibliography

1. *8 trends that define the IT market in Kazakhstan.* (2023). Retrieved from <https://astanahub.com/ru/blog/8-trendov-kotorye-opredeliaiut-it-rynok-v-kazakhstane>
2. *Academica.* (n.d.). Retrieved from <https://academica.kz>
3. *Altyn Almas.* (n.d.). Retrieved from <https://www.altynalmas.kz/>
4. *AstanaHub.* (n.d.). Retrieved from <https://astanahub.com/>
5. *Become a participant of Astana Hub and receive tax preferences.* (n.d.). Retrieved from <https://astanahub.com/en/registration/>
6. *BigData Team.* (n.d.). Retrieved from <https://bigdatateam.org/ru>
7. *Bureau of national Statistics.* (n.d.). Retrieved from Statistics of the standart of living: <https://stat.gov.kz/en/industries/labor-and-income/stat-life/publications/>
8. *Coursera.* (n.d.). Retrieved from <https://www.coursera.org>
9. *Databoom.* (n.d.). Retrieved from <https://databoom.kz/>
10. *DataNomix.* (n.d.). Retrieved from <https://datanomix.pro/ru>
11. *Deranty, JP., Corbin, T.* . (2024). Retrieved from <https://doi.org/10.1007/s00146-022-01496-x>
12. *Enbek.kz.* (n.d.). Retrieved from <https://www.enbek.kz/ru>
13. *EPAM.* (n.d.). Retrieved from <https://epam.com/>
14. *ERG.* (n.d.). Retrieved from <https://www.erg.kz/ru>
15. *EY Academy.* (n.d.). Retrieved from <https://eyacademycca.com/>

16. *Google*. (n.d.). Retrieved from <https://www.google.com/>
17. Gorbatov, S., Khapova, S., & Lysova, E. (2018). *Personal Branding: Interdisciplinary Systematic Review and Research Agenda*. *Frontiers in Psychology*, Volume 9. Retrieved from <https://doi.org/10.3389/fpsyg.2018.02238>
18. *HH*. (n.d.). Retrieved from <https://hh.kz>
19. *Hub Talks #23*. (2023). Retrieved from https://www.youtube.com/watch?v=_UIvrDivOG4&list=PL1qsVsdKAeyIb3rQ6ClXKLCb6FkBXkbLE&index=24
20. *IBM*. (n.d.). Retrieved from <https://www.ibm.com/>
21. *Investopedia*. (n.d.). Retrieved from <https://www.investopedia.com/ask/answers/041015/whats-difference-between-porters-5-forces-and-pestle-analysis.asp>
22. *IT personnel market of Kazakhstan. Trends, problems, solutions -PDF*. (n.d.). Retrieved from <https://digitalbusiness.kz/2024-05-23/kakoy-on-rinok-it-kadrov-kazahstana-rezultati-issledovaniya/>
23. *LinkedIn*. (n.d.). Retrieved from <https://linkedin.com/>
24. *List of priority activities in the field of information and communication technologies*. (2023). Retrieved from <https://law.gov.kz/client/#!/doc/130770/rus>
25. *Macquarie University*. (n.d.). Retrieved from <https://www.mq.edu.au/>
26. *nFactorial*. (n.d.). Retrieved from <https://www.nfactorial.school/>

27. *Outpeer*. (n.d.). Retrieved from <https://outpeer.io/>
28. *Power BI*. (n.d.). Retrieved from <https://powerbi.microsoft.com/>
29. *ProITivity* Retrieved from <https://proitivity.kz/>
30. *Samruk Business Academy*. (n.d.). Retrieved from <https://sbe.sk.kz/>
31. *Samruk-Kazyna*. (n.d.). Retrieved from <https://sk.kz/>
32. *Sergek Academy*. (n.d.). Retrieved from <https://sergek-academy.kz/>
33. *Solva*. (n.d.). Retrieved from <https://solva.kz/>
34. *State of tech workforce 2024*. (n.d.). Retrieved from <https://www.comptia.org/content/research/state-of-the-tech-workforce>
35. *State of the Tech Workforce 2024*. (n.d.). Retrieved from <https://www.comptia.org/content/research/state-of-the-tech-workforce>
36. *TechOrda's Programms*. (n.d.). Retrieved from <https://astanahub.com/ru/l/TechOrdaStudents>
37. *Tengizchevroil (TCO)*. (n.d.). Retrieved from <https://www.tengizchevroil.com/>
38. *The ICT market of Kazakhstan. Status and development forecasts up to 2027*. (n.d.). Retrieved from https://www.gov.kz/uploads/2024/2/12/0c6500bbaaa233b76e0c1101971415f4_original.8081299.pdf
39. *Udacity*. (n.d.). Retrieved from <https://www.udacity.com>
40. *Udemy*. (n.d.). Retrieved from <https://www.udemy.com>

41. Yang, W., Wei, Y., Wei, H. et al. . (2023). Retrieved from <https://doi.org/10.1007/s44230-023-00038-y>

42. ZhasOrken. (n.d.). Retrieved from <https://zhasorken.sk.kz/>

Appendices

Appendix A. The current financial statement of the ProITivity school.

| | Quantity | Price | Period (in months) | Revenue | Comments |
|---|----------|---------|--------------------|-----------|------------------------|
| Customers (covered by government grant) | 11 | 600,000 | 7 | 6,600,000 | |
| Customers (covered by internal grant) | 8 | 600,000 | 7 | 4,800,000 | Potential revenue loss |
| Customers (covered by | 13 | 600,000 | 7 | 7,800,000 | |

| | | | | | |
|---------------------------------------|---|---------|----|-------------|------------------------|
| government grant) | | | | | |
| Customers (with discounts 52%) | 7 | 290,000 | 7 | 2,030,000 | |
| Customers (covered by internal grant) | 7 | 600,000 | 7 | 4,200,000 | Potential revenue loss |
| Accountant | 1 | 210,000 | 14 | (2,940,000) | |
| CEO | 1 | 85,000 | 14 | (1,190,000) | |
| Platform support | 1 | 20,000 | 14 | (280,000) | |
| EBIT | | | | 12,020,000 | |
| Potential revenue loss due to | | | | 9,000,000 | |

| | | | | | |
|---|--|--|--|------------|--|
| internal grants | | | | | |
| Potential revenue loss due to discounts | | | | 2,170,000 | |
| Total revenue loss | | | | 21,090,000 | |

Appendix B. Interview with Islam Derbissalin, BIDynamics.

The company implements reporting, outsourcing, and support based on PowerBI. It works mostly with quasi-government and government agencies. They provide custom solutions using BI systems tools. The background of the person is reached, including experience in Big4, FMCG, TCO (Tengizchevroil (TCO), n.d.), and Samruk-Kazyna group sector providing.

Team Experience and Qualifications:

For the question of how they found clients, Islam mentioned his team's experience and qualifications, including certifications and expertise in a specialized field, with few competitors like Datanomix (DataNomix, n.d.) , and Geometry, that created certain credibility and met the qualification requirements for participating in tenders.

Internship Programs:

Islam talked about internship programs, such as "Digital Summer " and "Zhas Orken" (ZhasOrken, n.d.) which were supported by Samruk-Kazyna and provided employment and training opportunities. The "Digital Summer" program was completely free and included internships with the possibility of an offer at the end. The program lasted about three months, with a 30-40% employment conversion rate for graduates. The "Zhas Orken" program also offered a guaranteed offer upon internship completion. This internship lasted 2-3 years, with participants receiving training in various Samruk-Kazyna Group of companies. These programs were under the initiation of the Private institution "Samruk Business Academy" (Samruk Business Academy, n.d.) (formerly Corporate University "Samruk-Kazyna").

Examples of Successful Programs:

Islam highlighted examples of successful internship programs, such as SolvaTech (Solva, n.d.), which provides free training and employment for students. The program covers various fields, such as development, data analytics, and others. As the program is company-funded, it repays a percentage of its contract within a year after employment to offset training costs.

Graduate Employment Challenges:

‘TechOrda’ program graduates face employment challenges due to a lack of portfolios and assessment systems. Islam mentioned that the requirement of

the hiring procedure in his company is via platforms like Headhunter, and LinkedIn (LinkedIn, n.d.) with recruiters sharing job openings. ZhasOrken or Solva has a full portfolio of candidates to hire such as their skills, and project work. Islam suggested implementing an assessment system for graduates, including tests on verbal and logical skills and project evaluations. This would help employers better understand candidates' readiness. IT schools could start doing the same way of creating portfolios and assessment systems like ZhasOrken or Solvo.

Junior Requirements:

The interview also covered how Islam sees specialists on the Junior level. There should be certain requirements for juniors and their ability to handle commercial projects after training. Islam questioned what is meant by "junior," noting that a junior should be able to handle commercial projects independently, managing standard tasks. Islam highlighted that juniors should possess practical skills, such as working with IPs and handling basic tasks. This enables them to adapt more quickly to commercial projects. They should create final portraits of students for certain levels.

IT educational companies' strategy:

MakeIT interviews students for the position of Product Manager and takes 200,000 KZT as a deposit. MakeIT controls the completion of the course by students. If the course is not completed, then the amount is returnable. These grants are beneficial for companies and students, but not for AstanHub and

Government. Outpeer, Epam, Agile by Bakhytzhan ProductBI. They have already developed programs from the beginning like profile, assessment, and onboarding. Even with these developed programs, students face employment problems.

Courses, Real Cases and Certification:

Islam discussed the courses and certifications his company's employees pursue, including training in data visualization and business analytics. Islam shared that his company's employees undergo training in various fields, such as data visualization, business analytics, Power BI (Power BI, n.d.), SQL, and Python. All instructors are certified and have over five years of experience. Training includes solving real business cases from sectors like transportation and logistics, oil and gas, and manufacturing. Each case (about 10 cases) is part of a module and involves a personal project. The final personal project is based on different topics like HR analytics, project analytics, production, or other sector companies. During working on these cases, students answer hypotheses and provide functional dashboards. Tasks are based on real projects but use modified data. These cases can be written in a way that can create value for students. There are 2 modules for junior and middle/senior levels. They had practice when students passed both courses.

Junior, Mid-level, and Senior:

Islam discussed the ratio of juniors, mid-levels, and seniors in Islam's company, as well as their training and assessment process: 10% seniors, however,

the grading system is very tough for them, 60% middles, 30% juniors. As per his general experience, the most vulnerable employees are seniors and juniors during economic or organizational shortfalls, as seniors are expensive and juniors might not add value.

The company usually hires mid-level and senior-level employees from the market. The challenges for this position are based on specialists, e.g. GIS developers and data engineers, not data analysts. Sometimes they hire juniors and can be promoted to higher levels if the junior closes the project successfully and how successfully they completes internal education. They also could hire those who could teach through TechOrda. Prefers juniors for higher seniors/trainers could train further, for middles he has to spend his own time. That's why he prefers to hire middle/senior-level specialists from the market.

Demand for Data Analysis:

Mainly companies order automation of financial and management reports preparation using BI tools for taxi, leasing, and food industries in addition to quasi-government and government agencies. It can be a full report or a portion of a reports. They also target small businesses like pharmacies, private clinics, restaurants, and call and contact centers which includes atomization using BI tools and online education.

Data Protection and Information Security:

Aigerim and Islam discussed data protection and information security measures in Islam's company, including local servers and cybersecurity courses.

- **Local Servers:** Islam noted that for large companies and quasi-public sectors, data is stored on local servers, as regulations prohibit storing data on servers outside the country.
- **Cybersecurity Courses:** Except NDA, company employees undergo cybersecurity courses, covering essential skills and data handling practices. Additionally, software is installed to prevent data leaks.
- **Service Subscription:** Islam mentioned that the company subscribes to cybersecurity services costing around 150,000-200,000 KZT per month. These services include software installation and security consultations.

Sales Methods and Client Acquisition:

Islam discussed methods for sales and client acquisition for custom products, including cold calling, webinars, and referrals/networks, workshops, showroom showings, business lunches, presentations. He emphasized 2 categories of salesman: a leader picker and a hunter. The leader picker goes from the cold category to warm, then Hunter processes it to make it hot to close it. One of the successful strategies was through showroom presentations when some departments of the company agreed to have educational services from them. Also, there are academies like EY Academy, which has a requirement to cover the budget for education on a monthly, quarterly, or annual basis.

Online advertisement:

Site, context, target, context.

Aggressive Marketing and Info Business:

Aigerim and Islam discussed aggressive marketing and info business, including examples of successful schools and their strategies like Karpov, and Yandex practicum. Most Russian companies earn from education.

Industry Training and Development:

Islam expressed a desire to develop the industry and support young professionals, providing examples of successful cases.

Appendix C. Interview with Dinara Mussayeva, Experience with DataBoom

Motivation for taking courses:

Dinara explained that her role in logistics involved preparing various managerial reports for shareholders, which required collecting data from different departments. This process was time-consuming and prone to repetitive mistakes, such as data duplication or removal of necessary data. This was the reason to seek tools like Power BI (Power BI, n.d.) to improve the process.

Joining Data Boom:

Dinara decided to join Data Boom School to further improve her skills in Power BI. She was particularly impressed by Katarina Rehart's presentation and teaching style, which influenced her decision to enroll in the course.

Influence of Advertisements:

Dinara mentioned that when they started in 2020, the school was in its initial stages with minimal advertisements. However, in the last two years, the advertisements have become more aggressive. Dinara highlighted the significance of online presence and social media in promoting courses and engaging with students. They mentioned using platforms like Instagram and YouTube for marketing and communication.

Comparison with Other Schools:

Dinara mentioned that Data Boom School was not as popular then, and they did not remember other schools' names. They attended workshops from other schools but found them boring compared to Katarina's workshop. This preference for Katarina Rehart's workshop influenced her decision to study at Data Boom School.

Teaching Format:

Dinara explained that everything was online during the initial stages of the school.

Initial Learning:

Dinara initially learned Power BI through edX courses, which helped her understand the basics of the tool.

Application in Work:

Dinara applied Power BI in her logistics role to prepare various reports, which improved the efficiency and accuracy of the reporting process.

Role of Mentors and Teacher Assistants:

Dinara explained the role of mentors and teacher assistants in the learning process. They emphasized the importance of preparing and assisting students effectively.

Appendix D. Interview with Anarbek Utegulov, AstanaHub

The transcript covers a discussion about collaborations, student analytics, and reporting requirements for IT schools in Kazakhstan. Key points include:

Student Analytics and Completion Rates: The IT schools track metrics like enrollment, the background of the student, completion rates, and job offers received by students. Schools receive funding only for students who complete courses of six months or longer.

Junior-Level Oversupply: There's a surplus of junior IT specialists due to foundational courses that retrain professionals from non-IT backgrounds, while mid- and senior-level training options are limited. Most of the courses were for beginners, as the purpose was precisely to retrain people who are not from the IT field because there is a shortage of specialists. There are certain terms within the framework of TechOrda, one grant recipient cannot study twice in different courses. The only option is when it will be possible to continue studying at the same IT school, where he received, say, a basic course. If this school has an advanced course on the same topic, then he can apply to this school, having received a repeat grant. But there are not many such schools, so in this part, such a situation has developed.

Collaboration Among Schools: IT schools may share graduate data, enabling advanced courses to target students with foundational skills.

Astana Hub's Role: Astana Hub provides support for IT startups through programs and tax incentives, and some schools receive grants if they offer

relevant advanced courses or outsource data analytics specialists. They monitor how they work in the market. After 1 year we look at the dynamics of employment of their graduates, and how much it has changed, yes, do they help their students, and graduates in this part. Plus, we collect feedback from students every month, on how satisfied they are with the quality of education in this school, were there any questions about communication, completing homework assignments, transferring homework assignments, and so on. That is, we take all these points into account, and as reference information, we transmit the data, like information from an independent commission, so that they take this into account when accrediting a new stream, if this list includes schools that have previously passed the program. Some open for one year, but the next year we see that they are not quite high-quality, so they do not receive accreditation there. But at the same time, we want to be open and accessible to everyone who wants, say, to open a programming school in some region. This is for the whole country, and we want this point of programming human capital to be created in the regions too. In fact, within the framework of the program, there are incentives when if you conduct an offline school in a region, it is registered there, you have statistics, and then there are reference coefficients that are used to ensure that it has more code.

Quality Control and Accreditation: Schools are accredited annually, based on factors such as job placement rates and student feedback. There's an effort to maintain only high-quality schools. About 80% have a job after

completion. If we do not consider university students, then the percentage is about 88-89%. It is reviewed using tax payments for graduates.

Regional IT Hubs: The program encourages regional IT education development, offering incentives to schools that establish themselves in remote areas.

Outsourcing: There is a certain list of types of activities, this is called authoritative activity, if within its framework you provide services to the market, then, in principle, the entire benefit, is kind of available, yes, the company. In general, I think, yes, outsourcing, specifically IT services, if this is it, then yes, because we also have various programs that support such outsourcing companies that want to scale their services there, including on the international market.

Appendix E - Meeting with Chinese Construction Corporation leaders.

General information

The company primarily focuses on road construction in Kazakhstan, the main client is the government agencies. They are currently working on 3 major projects but are facing issues in recording financials. Due to differences between Chinese and Kazakhstani financial statements and difficulties in understanding the local use of the 1C system for financial management, they are seeking collaboration with local professionals to make the financial statements understandable for the Chinese parent company. They are currently collaborating with an accounting firm in China, but the firm charges high fees and is manually translating the accounts, resulting in slow progress on the financial statements.

Communication details.

We spent quite a lot of time understanding their needs, the volume of actual work, and trying to make it clear about what we can offer them. In the meeting, we also discussed the demand for the same service in Chinese companies based in Kazakhstan in the future. The leader of the company revealed that there are a lot of Chinese companies that are facing this problem, this work cannot be done quickly, because it faces difficulties in communication from both sides. It's been 7 years (except during the pandemic period), and they still haven't found a proper way to solve it.

The thoughts behind collaborating with Chinese companies in the future

- Providing training courses for their accounting employees on using BI systems tools.
- Offering consulting services as an exchange of case studies to ProITivity's students.

Appendix F. Insights from Industry Interviews on Data Analytics and Team Development

The following summarizes key insights from two separate interviews with industry professionals discussing data analytics outsourcing, team development, and fostering a data-driven culture within diverse business environments.

Outsourcing vs. In-House Teams: Both interviewees expressed mixed views on outsourcing data analytics functions. While outsourcing can reduce costs, it introduces risks to data security and confidentiality, especially for sensitive business information. Both preferred in-house teams for core analytics tasks, citing closer alignment with business needs and continuity for long-term projects. They agreed that secondary tasks, like data annotation, might be more suitable for outsourcing.

Data-Driven Decision-Making: Both companies are in the process of transitioning to data-centric decision-making, moving away from intuition-based management. They highlighted challenges in changing established corporate mindsets, particularly with employees accustomed to traditional decision-making practices. However, there is a strong commitment to educating teams on the importance of data-driven insights, using analytics as a foundation for more informed business decisions.

Hiring Strategies and Social Responsibility: Each interviewee discussed a focus on hiring junior employees, including those without extensive analytics experience, to provide growth opportunities. They cited a sense of social

responsibility in nurturing young talent, allowing motivated individuals to develop within their companies. One professional noted that hiring juniors directly from educational institutions could reduce recruitment costs and streamline the hiring process.

Partnerships with Educational Institutions: Both professionals were open to establishing partnerships with educational institutions to facilitate internships and entry-level hiring. By partnering with IT schools, they could source interns and juniors who have been trained in relevant skills, enabling faster onboarding and alignment with the company's needs. These collaborations could also include guest lectures and internship programs, providing students with practical experience while addressing companies' staffing needs.

Practical Skills for Data Analysis: The need for practical data analysis skills was a recurring theme. The interviewees emphasized that students should be trained in real-world applications, such as sales trend analysis in retail, to prepare for industry challenges. One company mentioned that they are actively looking for candidates who can contribute to optimizing sales and promotions, underscoring the importance of applied, hands-on learning for future data analysts.

Retention Challenges: The interviewees acknowledged the difficulty of retaining young employees, noting that newer generations are often more mobile and may seek frequent changes. To address this, they suggested providing

performance-based incentives and fostering a growth-oriented environment to build long-term loyalty.

Security Concerns: Security risks in outsourcing were also discussed, with one company sharing an experience of a data breach due to internal system vulnerabilities rather than outsourced tasks. Both interviewees highlighted the importance of trusted partnerships and secure handling of sensitive data, especially when outsourcing data analytics tasks.

This combined summary highlights industry best practices and challenges in building data analytics teams, fostering a data-driven culture, and collaborating with educational institutions to source and train skilled analysts. These insights emphasize the importance of balanced hiring strategies, careful consideration of outsourcing, and proactive partnerships with educational institutions.

Appendix G - Interviews with granted students (ProITivity)

Darina Kukshibaeva

How do you like the course? *Good. I finished it.*

What city are you from? *Semey.*

Do you live there or work somewhere? *Yes, the company, Eikos.*

Why did you apply for the course? I have a department called Analysis and Procurement Planning. Therefore, first, I wanted to improve my skills, because we have problems in the company. And advancement in this area.

Why did you choose data analytics? I'm interested in working with numbers.

Have you applied to any other schools besides ours? *Yes, I have.*

What answer did you get? *I didn't pass there.*

Do you currently use the knowledge and skills you gained at work? *Yes, PowerBI came in handy.*

Have there been any changes in my position or salary? I recently went on a business trip, and they presented my report there. I don't know yet, but it seems possible.

Main motivation? At my current job, further development is planned. Perhaps moving.

What were your expectations from the course? I wanted to learn how to work with SQL and Python in RPI. I just realized that I can't use SQL and Python in my organization since we work in DNS and don't understand SQL and Python.

Did you do anything else? Stepika, I started SQL there.

Why did you choose our course? You took me. I liked the live communication with the teacher; they explained things online. I have friends who also took the courses. They just sent me videos without explanation, and they had difficulties.

Maybe you have some questions? Will there be a course with an upgrade?

We are planning to.

Zhanna Nurtlessova

What are the main reasons for choosing data analytics courses, and why?

The main reason for choosing data analytics is that I am more analytical than a developer. Naturally, at that moment, it seemed to me that I could not handle a developer. I wanted to go offline to a field where I understood something. I am a person with an analytical mindset. I played chess. I like to look for problems and their solutions.

What goals did you set for yourself when you signed up for the course?

First, I want to gain knowledge so there will be a mentor. Second, to use this knowledge at work or get another job.

I have my own medical research; analytics are also needed there. We used AR there, but we did not go into great depth, and there was practically no knowledge.

What were your expectations before and after applying? Yes, I now feel more confident in my knowledge, perhaps because we took exams several times. And, when you see a task, you are not afraid but already get down to business.

Even if you don't know something, you know where to find it. Secondly... now I can choose a job, not have it choose me.

Did you apply to other schools? Yes, I applied to several schools, but at the last minute.

What was important to you in school? Firstly, online, and secondly, the program. Website.

Maybe you still have some questions? - When does the next stream start? Yes, recruitment has already started at Techord.

Ulzhan Orynbek

Are you currently working? No, I'm currently on maternity leave.

Were you also on maternity leave when you applied for the course? *No, I was working.*

Why did you decide to apply for the data analytics course? I wanted to change my profession and have remote work or a flexible schedule.

Is this related to maternity leave? No, the maternity leave happened after I had already applied for and been accepted for your grant.

Are you currently looking for a remote data analytics job? No, I'm not looking now because I'm about to give birth.

Have you applied to other schools besides our course? Yes, I did. There was a second grant—I don't remember the name—and I was on the waiting list there. Three rejected me.

Do you have any expectations for the course? At first, I didn't know what data analysis was. My husband is a developer. I see how he works; he has a flexible schedule, and he has several jobs. She can work from home and gets a good salary, so I also thought, why not try it?

I applied, I liked the course, and I understood how to write codes in general. There is a lot of practice in Stepik; I want to practice and then apply for a job right away.

Did you manage to apply any of your knowledge at work? Unfortunately, no, I work as an architect; I mainly do drawings and practically didn't need analytics.

Of the modules you completed, which was the most useful for you? I liked Python; it was the easiest. I mainly used statistics. Power BI was already new.

Appendix H - interview with Alexey Dral - owner of BigData Team

1. How did you survive without Astana Hub?

It's impossible to survive. The average price for these courses in Kazakhstan is lower than in Russia. We continued providing B2B services for companies but didn't offer B2C teaching.

2. What methods of attracting customers did we use before AH?

Nothing. Word of mouth. Russian companies addressed us. Some individuals come from Europe and America because we are known in Russian-speaking societies.

3. Describe a typical portrait of the non-AH student.

We don't distinguish B@B and B2C students. We can do that, but we need to open statistics. Generally, they are 25-45 years old and work in the IT industry. They came to improve their qualifications. 50/50 pay by themselves and by company. 50/50 gender distribution.

4. Which rooms need improvement in your school?

There is always room for improvement. However, the following steps require substantial financial investments. For example, 24/7 support and feedback. It costs inadequately a lot.

We are working on infrastructural improvement, developing our educational platform, and introducing our LLM (AI tool), which can replace the 24/7 support manager and answer any data analytics questions.

5. What are you going to do after AH closed? What strategy?

Chill 😊 TechOrda is a start for us in Kazakhstan. Now, our graduates can work by word-of-mouth and attract students from their companies. They may also attract the companies themselves. Our courses are for advanced students, so all our students are already working somewhere. They can show what they learned at work and attract colleagues and employers. Thus, we enter the companies of Kazakhstan. Some companies already approached us to teach their employees.

Further, we are going to launch the international product in English. There are three offers: cheap, medium, and expensive. We will launch English courses in the USA and India because they acquired our cheapest courses on Coursera. The Kazakh market is small for us. We are going to scale through the most affordable products in countries with significant populations.

Appendix I - Interviews with self-payees -ProITivity

1. What was your level of data analysis skills before taking courses?

Sharafat: I know Excel but need to learn data analysis from scratch. I worked in a bank, and I am on maternity leave now.

Darina: Minimal; I only knew Excel.

Aibike: zero. I know what data scientists do.

Yershat: I already know Python, data visualization, machine learning, Excel (in the framework of my work), and statistics. I am a teacher at University (Demerel and NarKhoz).

2. Why did you decide to study (learn data analysis)?

Sharafat: I need online work. I am good at math (economics).

Darina: I work with data. I am a business analyst.

Aibike: I'm seeking a job in the oil and gas industry. When I worked, I dealt with big data, which is necessary for work.

Yershat: I have academic knowledge but want to obtain practical one.

3. What results did you expect to gain?

Sharafat: Get knowledge and do data analysis at work.

Darina: I can make Requests and graphs by myself. I can also show it to my boss, who will promote me.

Aibike: improve and get new knowledge to apply to work. Be more effective: solve time-consuming problems in one click.

Yershat: Learn PowerBI and understand how well I fit fieldwork (not academy).

4. How did you gain these results before going to IT school?

Sharafat: Analyzed the market, checked HH.kz, and communicated with people to get recommendations.

Darina: nothing

Aibike: youtube

Yershat: Coursera, Stepic, youtube, and practice on tasks. Colleagues also recommended courses.

5. What was essential for you to do while choosing a school?

What do you pay attention to first?

Sharafat: Online format.

Darina: I checked the description and syllabus. Online format and evening lectures were also important. At this type of course they provide mentor's support and feedback, and help with employment. Moreover, they usually give discounts and grants and the studying helps to create a useful network with peers.

Aibike: I checked all the descriptions of all the courses on TechOrda.

Yershat: application of statistics and Python on practice, PowerBI, machine learning.

6. Why did you decide to study at this school?

Sharafat: 10% deposit, 70% discount, monthly payments. The school is in Astana. The site quickly describes the results. I submitted it late, but I had only two responses.

Darina: I applied only to this school. I thought their course would be better because their price is higher than the grant price. They are offering a 50% discount.

Aibike: everybody rejects my application except for ProITivity. 30.000 monthly payment. A teacher from NU. I chose that course because the school is a member of TechOrda program.

Yershat: I got a discount. Without the discount, I wouldn't have bought the course because I am used to getting knowledge for free. Maybe I chose Databoom because I saw their advertisement everywhere, and they also offered a 70% discount. But, ProITivity managers called me first, and I agreed to study here.

7. What do you like in the education process? What don't?

+

Sharafat: clarity. The material is explained clearly. It's online. Interesting homework tasks, recorded video. Saturday's analysis.

Darina: The time is convenient; you can leave the meeting without questions.

Aibike: Homework helps students understand the material.

Yershat: homework is excellent; I like them.

Sharafat: It's expensive if you buy at the total price.

Darina: There is an obligation to turn on the camera.

Aibike: no.

Yershat: The teacher is not pedagogical; he cannot explain and looks bored and tired.

8. Did you gain your seeking results? How do you understand that?

Sharafat: I will find a job and will apply my knowledge. I am ready for 150.000 tenge as a start salary to gain experience.

Darina: I can do test tasks without anyone's help. I can apply at work.

Aibike: apply on practice.

Yershat: I will compare my knowledge with the material. If it matches, it means I am ready. After graduation, I will apply for a job.

Appendix J - interview with self-payees from other schools

1. What was your level of data analysis skills before taking courses?

Timur: before my first course – zero. I am a senior data analytics now

Alikhan: Before the course, I had experience working with small data and encountered tasks at work and school. These tasks taught me the basics of data analytics.

Akylbek: middle data scientist, language models (ChatGPT, Lama), NLP engineer/three years of experience. I have a bachelor's degree in electrical and computer engineering, but finding a job in electrical engineering wasn't easy. Besides, there is a salary ceiling in electrical engineering. I decided to switch to programming.

2. How did you gain these results before going to IT school?

Timur: I took three courses on computer science at university.

Alikhan: I reached this level by taking various courses, both paid and free, and gaining practical experience at work.

First: free courses on YouTube, for example, "Power BI for Beginners". These are simple screen recordings with instructor commentary.

Second: paid courses (around \$100) on Udemy Business. Also, screen recordings with commentary and practical assignments that are not checked.

Third: courses within TechOrda (grant for 600 thousand tenge) on advanced data analytics, screen recordings, practical homework, additional calls, and office hours.

Akylbek: I have a bachelor's degree in electrical and computer engineering. I was in the TechOrda program in 2022. It was a course on web design (front end). I wouldn't say I liked the non-adaptability of the schedule of this course.

3. Why did you decide to improve your skills/knowledge in data engineering?

Alikhan: Strengthening my knowledge in data engineering is necessary due to the specifics of my current job.

Akylbek: I want to be more universal and have knowledge in data science to grow in my career and become a senior and team leader. Team leaders understand all processes. I also want to understand more language models and audio processing.

4. What results did you expect from the training?

Alikhan: I wanted to understand the logic of building scripts for analytics better and be able to work with them freely.

Akylbek: I do it for myself to solve different tasks quickly in any situation. It makes my work with unfamiliar tasks faster.

5. What was essential for you to do while choosing a school?

What do you pay attention to first?

Timur: interactivity, the ability to learn while doing tasks.

Alikhan: Initially, I used free courses thanks to corporate access to Udemey Business. Later, I chose courses based on reviews and successful cases to ensure their effectiveness and significance.

Akylbek: Flexibility. I prefer self-education, which includes books and courses on Udemey and other platforms. If I have a question, I can ask them in the Udemey forum. The average price of courses is \$75, but they regularly arrange sales. It is possible to buy a course for \$10-13.

6. Why did you decide to study at this school?

Timur: I learned myself at CodeCademy and Hacker Ung platforms. I watched videos on Codecademy and solved tasks on Hacker Ung. I bought a subscription.

Alikhan: The final decision was based on several factors: reviews, successful cases, and the course's availability.

7. What did you like about the training process?

Timur: interactivity

Alikhan: The effectiveness of the paid course is undoubtedly higher. However, much depends on how the material is perceived: sometimes, YouTube videos on a specific topic are more beneficial than other courses.

Practical classes were one of the training's most valuable and exciting aspects.

8. What would you like to improve, change, or add to the training process?

Timur: I got tired quickly. They teach you to solve tasks but not confirmed cases. There should be an actual project to solve.

Alikhan: I want to add gamification elements to make learning more engaging and effective.

9. Did you gain your seeking results? How do you understand that?

Timur: I was hired by Beeline. record

Alikhan: Yes, I have achieved my goals. Now, complex tasks and moments where there was a lack of knowledge before are solved much more effortlessly.

Akylbek: Usually, middle specialists look for advanced courses. Seniors already know a lot, and they need to integrate into the work community.

Appendix K. Basic information of courses on Coursera

| Competitor name | Course name | Course level | price | duration | enrollment |
|-----------------|---|--------------|----------|---------------|------------|
| IBM (IBM, n.d.) | IT) Fundamentals for Everyone | Beginner | | 1-3 month | 13,871 |
| | Data Analyst Career Guide and Interview Preparation | Beginner | | 10h(1-3weeks) | 25,121 |
| | IBM Data Analytics Professional Certificate | Beginner | 25,000tg | 3-6 month | 313,126 |
| | Data Analysis with Python | Intermediate | 25,000tg | 1-3 month | 481,119 |

| | | | | |
|--|----------|----------|-----------|-----------|
| Python for Data Science, AI developme nt | Beginner | 25,000tg | 1-3 month | 480,866 |
| Introductio n to data analytics | Beginner | 25,000tg | 1-3 month | 608,104 |
| Excel Basics for Data Analysis | Beginner | 25,000tg | 1-3 month | 380,104 |
| Cybersecuri ty for everyone | Beginner | 25,000tg | 1-3 month | 103,898 |
| What is data science? | Beginner | 25,000tg | 1-4weeks | 1,057,144 |
| Databases and SQL for Data | Beginner | 25,000tg | 1-3 month | 494,834 |

| | | | | |
|---|--------------|----------|-----------|---------|
| Science with python | | | | |
| IBM Data Engineering | Beginner | 25,000tg | 1-3 month | 97,044 |
| Data analysis with Excel and R | Beginner | 4090tg | 3-6 month | 47,689 |
| Data Analysis and Microsoft Excel | Intermediate | 5000tg | <2h | 814,998 |
| Applied Data Science | Beginner | 4090tg | 3-6 month | 66,884 |
| Data Science Fundament | Beginner | 4090tg | 3-6 month | 54,855 |

| | | | | | |
|--------------------------------|--|----------|----------|--|---------|
| | als with Python and SQL | | | | |
| Knowledge Accelerator s | From Excel to Power BI | Beginner | 25,000tg | 1-4month | 164,395 |
| Microsoft | Microsoft Power BI data Analyst | Beginner | 25,000tg | 3-6 month | 208,016 |
| | Microsoft Business Analyst | Beginner | 25000tg | 3-6 month | 26,835 |
| Johns Hopkins University | The Data Scientist's Toolbox | Mixed | free | 17 hours(3we eks 5 hours a week) | 747,700 |
| | Healthcare IT Support | Beginner | 5290tg | 3-6 month | 21,085 |

| | | | | | |
|------|---|--------------|----------|-----------|-----------|
| | Specialization | | | | |
| | Business Analytics with Excel: Elementary to Advanced | Intermediate | 25,000tg | 1-3 month | 449,203 |
| | Foundations: Data, Data, Everywhere | Beginner | 4090tg | 1-4 weeks | 2,870,184 |
| | Data Science Specialization | Beginner | 16290tg | 3-6 month | 492,993 |
| Meta | Meta Data Analyst professional certificate | Beginner | 25,000tg | 3-6 month | 20,575 |

| | | | | | |
|---------------|--------------------------------------|--------------|----------|-----------|---------|
| | Introduction to data analytics | Beginner | 25,000tg | 1-3 month | 59,277 |
| | Introduction to Microsoft Excel | Intermediate | 4990tg | <2h | 816,300 |
| | Python Data Analytics | Beginner | | 1-3 month | 11,538 |
| | Data Analytics Methods for Marketing | Beginner | | 1-4weeks | 24,164 |
| | Marketing Analytics Foundation | Beginner | | 1-4weeks | 84,229 |
| University of | Business Analytics | Beginner | 26,000tg | 3-6 month | 191,531 |

| | | | | | |
|--|---|----------|----------|-----------|---------|
| Pennsylvania (University of Pennsylvania n.d.) | Operations Analytics | Mixed | | 1-4weeks | 121,801 |
| | Accounting Analytics | Mixed | | 1-4weeks | 112,928 |
| | Customer Analytics | Mixed | | 1-3 month | 290,933 |
| | People Analytics | Mixed | | 1-4weeks | 141,125 |
| University of Amsterdam (University of Amsterdam , n.d.) | Data Analytics for Six Sigma | Beginner | 25,000tg | 1-3 month | 191,531 |
| Google (Google, n.d.) | Google Advanced Data Analytics | Advanced | | 3-6 month | 138,691 |

| | | | | |
|--|----------|----------|-----------|---------|
| Professional Certificate | | | | |
| System Administration and IT Infrastructure services | Beginner | free | 1-3 month | 470,391 |
| Automate Cybersecurity Tasks with Python | Beginner | 25,000tg | 1-3weeks | 184,224 |
| Google Data analytics Capstone: Complete case study | Beginner | 4090tg | 1-4weeks | 518,007 |
| Google Advanced Data | Advanced | 20,000tg | 1-4weeks | 40,880 |

| | | | | |
|---|----------|-----------------------|-----------|-----------|
| Analytics Capstone | | | | |
| Google Data analytics Capstone professiona l certificate | Beginner | 4090tg per month | 3-6 month | 2,417,193 |
| Google Business Intelligence Professiona l Certificate | Advanced | 20,000tg per month | 3-6 month | 92,744 |
| Google Cloud Data Analytics | Beginner | 25,000tg | 3-6 month | 7,077 |
| Google Data Analytics | Beginner | 4090tg per month | 3-6 month | 138,691 |

| | | | | | |
|---|-----------------------------------|--------------|---------|-----------|-----------|
| | Professional Certificate | | | | |
| | Google Data analytics | Beginner | 4090tg | 3-6 month | 2,417,193 |
| | Process Data from Dirty to Clean | Beginner | 4090tg | 1-3 month | 707,384 |
| | Data Analysis with R programming | Beginner | 4090tg | 1-3 month | 609,193 |
| University of Illinois Urban-Champaign (University of Illinois) | Business Analytics Specialization | Beginner | 12790tg | 3-6 month | 17,951 |
| | Data Mining | Intermediate | | 3-6 month | 62,781 |

| | | | | | |
|---|--|--------------|--------|-----------|--------|
| Urbana-Champaign, n.d.) | Specialization | | | | |
| Macquarie University (Macquarie University, n.d.) | Excel Skills for Data analytics and Visualization Specialization | Intermediate | 5290tg | 3-6 month | 90,996 |

| | | | | | |
|--------------------------------|---|--------------|---------|-----------|---------|
| University of Colorado Boulder | Introduction to Data Analytics for Business | Beginner | 16290tg | 1-4weeks | 180,991 |
| | Advanced Business Analytics | Intermediate | 16290tg | 3-6 month | 61,031 |

| | | | | | |
|---|--|--------------|----------|-----------|---------|
| Coursera Project Network (Coursera Project Network, n.d.) | Introduction to Microsoft Excel | Intermediate | 4990tg | <2h | 816,300 |
| Tableau Learning Partner (Tableau Learning Partner, n.d.) | Tableau Business Intelligence Analyst Professional Certificate | Beginner | 25,000tg | 3-6 month | 32,435 |
| PwC (PwC, n.d.) | Data-driven Decision Making | Beginner | 16,000tg | 1-4 weeks | 191,226 |
| Coursera Project Network and W3School (W3Schools, n.d.) | Data Analysis with SQL: Informa Business Decision | Beginner | 4990tg | <2h | 1,924 |

| | | | | | |
|--|---|--------------|---------|-----------|---------|
| University of Illinois Urban-Champaign (University of Illinois Urbana-Champaign, n.d.) | Accounting Data Analytics | Intermediate | 25000tg | 3-6 month | 10,268 |
| | Digital Marketing Analytics in Practice | Beginner | | 1-4 weeks | 126,940 |
| | Applying Data Analytics in Finance | Intermediate | | 1-3 month | 25,442 |
| Rutgers the State University of New Jersey (Rutgers, The State University of New Jersey, n.d.) | Supply Chain Analytics | Beginner | 25000tg | 3-6 month | 37,741 |
| | Inventory Analytics | Beginner | | 1-4 weeks | 18,300 |

| | | | | | |
|--|--|----------|---------|-----------|---------|
| Rice University (Rice University, n.d.) | Business statistics and Analysis | Beginner | 16290tg | 3-6 month | 92,797 |
| IBM and SkillUp EdTech | IBM Business Intelligence (BI) Analyst | Beginner | 25000tg | 3-6 month | 18,978 |
| Rutgers the State University of New Jersey | Supply Chain Analytics Specialization | Beginner | | 3-6 month | 37,741 |
| University of Virginia (University of Virginia, n.d.) | Marketing Analytics | Beginner | | 1-3 month | 339,913 |
| SAS (SAS, n.d.) | SAS Visual Business Analytics Professional Certificate | Beginner | | 3-6 month | 22,052 |

| | | | | | | |
|--|--|----------|--------|--|-----------|--------|
| ESSEC Business School (ESSEC Business School, n.d.) | Strategic Business Analytics Specialization | Advanced | | | 3-6 month | 36,175 |
| Unilever (Unilever, n.d.) | Using Data Analytics in Supply Chain | Beginner | | | 1-3 month | 3,784 |
| Coursera Project Network | How to optimize your INS account | Beginner | 5000tg | | <2h | 30,213 |
| Macquarie University (Macquarie University, n.d.) | Excel Skills for Data analytics and Visulaization Specialization | Beginner | 5290tg | | 3-6 month | 90,996 |

Language ⓘ

- English (5,285) ←
- Spanish (3,100)
- French (2,848)
- Portuguese (Brazil) (2,833)
- Arabic (2,790)
- German (2,703)
- Indonesian (2,678)
- Japanese (2,672)
- Korean (2,669)
- Chinese (China) (2,661)
- Ukrainian (2,632)
- Turkish (2,631)
- Italian (2,603)
- Russian (2,598) ←

Subject

- Business (1,731)
- Data Science (1,627)
- Computer Science (1,196)
- Information Technology (918)
- Physical Science and Engineering (304)
- Health (220)
- Social Sciences (157)
- Math and Logic (77)
- Personal Development (72)
- Arts and Humanities (58)
- Language Learning (25)

Appendix L. Detailed description of leading competitors.**Academica**

Academica provided introductory courses on data analysis. Their unique trade proposition is a 100% guarantee of employment. They promise employment due to the high quality of their courses and five projects in the final portfolio of alums. They also offer installment plans and a total return of money during the first week of study if consumers don't like the course. They apply aggressive marketing techniques to attract customers: target and context ads, selling webinars, and developing the sales department (Academica, n.d.).

BigData Team

BigData Team stands out due to its focus on Big Data and Machine Learning education since 2017. They pride themselves on having instructors from prestigious institutions like the Faculty of Mechanics and Mathematics at Moscow State University and the Yandex School of Data Analysis (ShAD). In 2023, they reached 100,000 learners through Coursera. BigData Team doesn't spend money on marketing. They promote their courses through word-of-mouth.

Outpeer

Outpeer is an educational platform that provides knowledge in data analytics, data science, python and blockchain engineering, computer science & robotics. The outpeer.kz was established in 2021 to make professional

development among young professionals in the IT sphere more valuable and essential. Now, they are presented in TechOrda with courses like Python Engineering, Data Analytics, Data Science, and AI Engineering. Outpeer doesn't use marketing tools actively and promotes its courses through word-of-mouth.

nFactorial School

nFactorial School is renowned for its coding and technology skill programs. It focuses on intensive boot camps that provide hands-on experience in software development, data science, and other tech-related fields. This school strongly emphasizes practical learning, with students working on real-life projects under the mentorship of industry professionals. nFactorial School is crucial in transitioning students into tech careers locally and internationally. nFactorial started their business from free courses. Now, they use digital marketing tools to attract students.

DataBoom

Established by a Microsoft MVP, Ekaterina Rekhert, DataBoom is a significant participant in the data analytics education market. Professional training in business intelligence technologies, including Power BI, SQL, Python, and Excel, is an area of expertise. Besides providing education, DataBoom helps firms upskill their personnel without requiring full-time data analysts through corporate consulting services. Their alliances with businesses like Kolesa Group,

Beeline, and KPMG strengthen their standing in the industry. DataBoom applies aggressive marketing strategies to attract customers: they put enormous amounts of money into digital marketing.

Sergek Academy

As part of the Sergek Group of companies, Sergek Academy provides practical, real-world skills that help students become more valuable players in the job market. The academy offers training programs in fields such as system analysis, data analysis, and business analysis. Given that Sergek Group operates a sophisticated video monitoring system that significantly contributes to traffic safety and monitoring public spaces in Kazakhstan, Sergek Academy creates and promotes new data analytics talent, feeding this expertise back into the Group's operations.

| Name of the school | Price | Content |
|--------------------|---------|--|
| BigData Team | 756,000 | HDFS, Map Reduce, Hive, Spark, RT, NoSQL, Data layout |
| Outpeer | 850,000 | Excel, SQL, Power BI и Python |
| nFactorial School | 600,000 | Excel, SQL, Power BI и Python |
| DataBoom | 598,000 | Excel, SQL, Power BI и Python |

| | | |
|----------------|---------|--|
| Sergek-academy | 600,000 | Excel, Google Sheets, Pandas, Matplotlib & Seaborn, SQL, Power BI и Python |
|----------------|---------|--|

Strategies of competitors

The BigData team uses its academic credibility and expertise in cutting-edge fields such as big data and machine learning to attract motivated students. The team's teachers work in educational institutions with a high reputation, which is a significant advantage for students seeking specialized knowledge. Their strategy includes focusing on high-demand areas such as Hadoop, Hive, and Spark, which attract professionals seeking career advancement in data science. The BigData team also ensures the individual selection of students to maintain quality, strengthen the reputation of their brand, and provide advanced education.

Outpeer takes a more corporate approach, offering courses tailored to business needs. They rely on referral programs, personalized scholarships, and discounts to attract students who pay for themselves. Their strategy of delivering hands-on data analysis courses such as Excel, SQL, Power BI, and Python allows them to serve both beginners and professionals. Outpeer's focus on the business application of data analytics also attracts companies seeking to improve the skills of their employees, which ensures a constant influx of students from the corporate sector.

Factorial School focuses on hands-on learning by offering intensive training camps in software development, data processing, and other technology-related fields. Their strategy is based on practical projects and mentoring by industry professionals, which allows students to gain practical skills that can be immediately applied in the workplace. The school places particular emphasis on a collaborative learning environment, making it attractive to students seeking technical skills and high-tech networking opportunities.

DataBoom specializes in corporate training and consulting in addition to its educational offerings. The company focuses on developing business intelligence and data analysis skills using tools such as Power BI, SQL, and Python. DataBoom cooperates with companies such as Beeline, KPMG, and the Kolesa Group, which increases brand credibility and helps attract professional listeners. In addition, DataBoom occupies a unique niche in the promotion of women in the field of information technology through partnerships with organizations such as American Space Almaty and the USA. Embassy, creating a diverse and motivated student base.

Sergek Academy, as part of the Sergek Group, applies a practical approach to education based on actual events. Their strategy aims to provide students real-world problem-solving assignments and internships at Sergek Group companies. This strategy ensures that students can immediately apply their knowledge in a professional environment, which increases their chances of employment. Sergek Academy's unique approach is to offer its students, who have achieved the best

results, the opportunity to practice at Sergek Group. This allows students to apply their knowledge in real life while increasing their chances of receiving job offers after completing an internship.

| School | advantages | disadvantages | strategy |
|--------------|--|---|---------------------------------|
| Academica | 100% guarantee of employment, five projects in the final portfolio of alumni. Full return of money during the first week of study if consumers don't like the course | the price for the basic course is 800.000 tenge, they don't provide grants and discounts. | aggressive marketing techniques |
| BigData Team | very experienced instructors | courses for advanced data scientists | word-of-mouth |

| | | | |
|-------------------|--|---|---|
| Outpeer | variety of courses | quite expensive basic courses | word-of-mouth, corporate approach |
| nFactorial School | bootcamps, real life projects | rely on TechOrda | digital marketing tools |
| DataBoom | upskill their personnel without requiring full- time data analysts through corporate consulting services | intrusive service, too much advertisement | very aggressive marketing |
| Sergek Academy | offer its students, who have achieved the best results, the opportunity to practice at Sergek Group | rely only on techOrda | TechOrda residents |

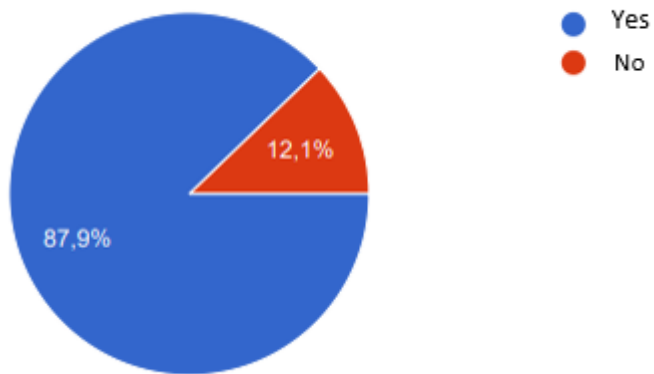
Appendix M Research of data analysis training needs.

1.1 Do you need data analysis skills in your life?

Mark only one oval.

Yes

No



2.1 How often do you use data analysis in your life?

Mark only one oval.

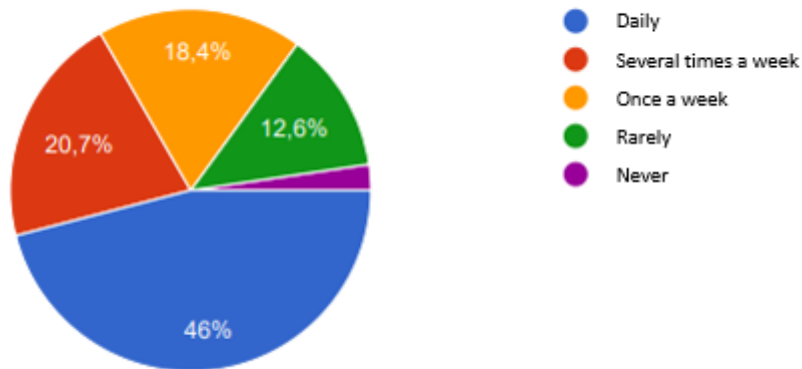
Daily

Several times a week

Once a week

Rarely

Never



2.2 In what main areas do you apply data analysis?

(you can select several)

Optimization of business processes

Data-driven decision making

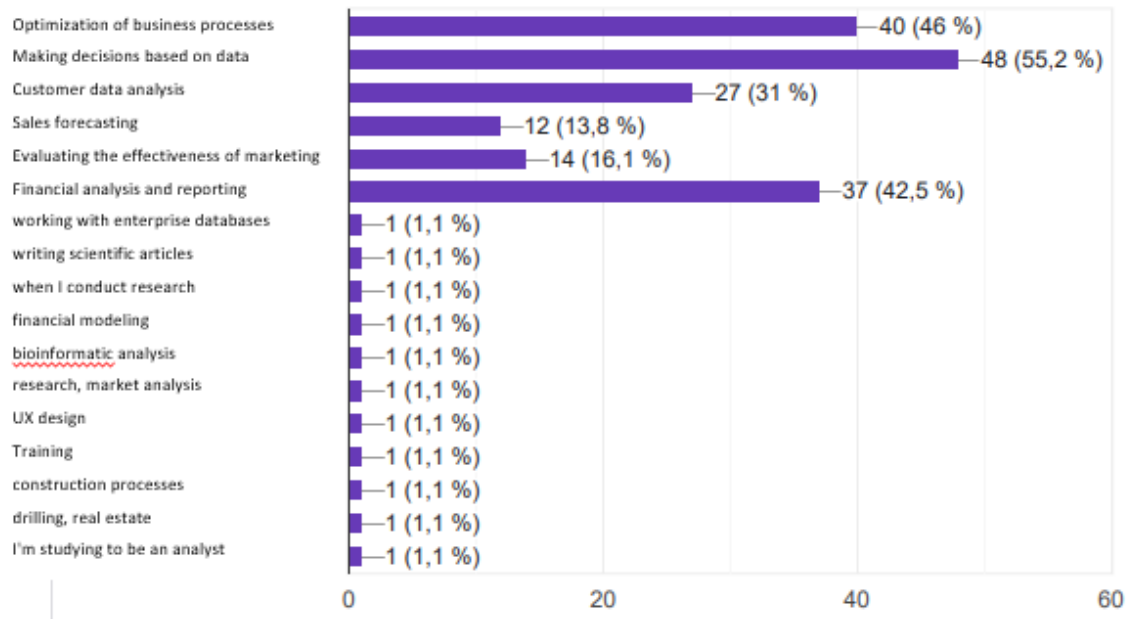
Customer data analysis

Sales forecasting

Marketing Effectiveness Assessment

Financial analysis and reporting

Other:



2.3. What difficulties did you encounter when working with data? You can select multiple answers.

Lack of knowledge in tools (SQL, Python, etc.)

Difficulties in interpreting data

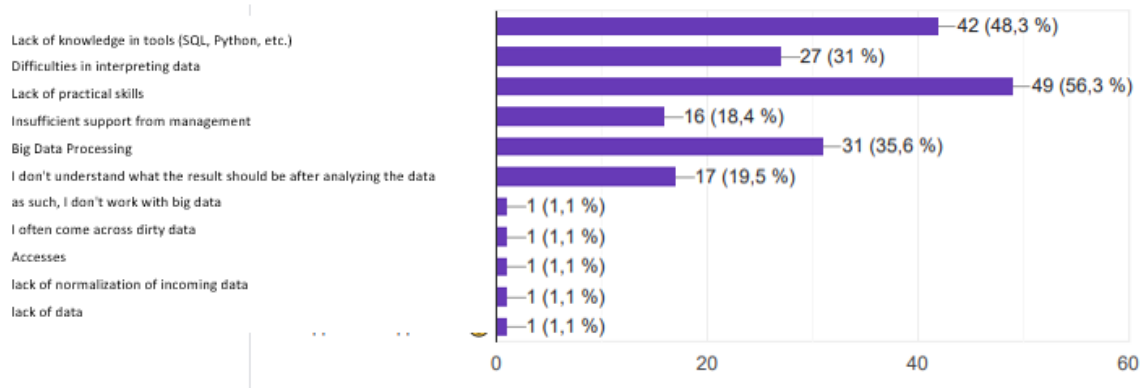
Lack of practical skills

Insufficient support from management

Big data processing

I don't understand what result should be obtained after analyzing the data

Other:



2.4 What have you done to improve your data analysis skills?

Mark only one oval.

Other:

Took courses



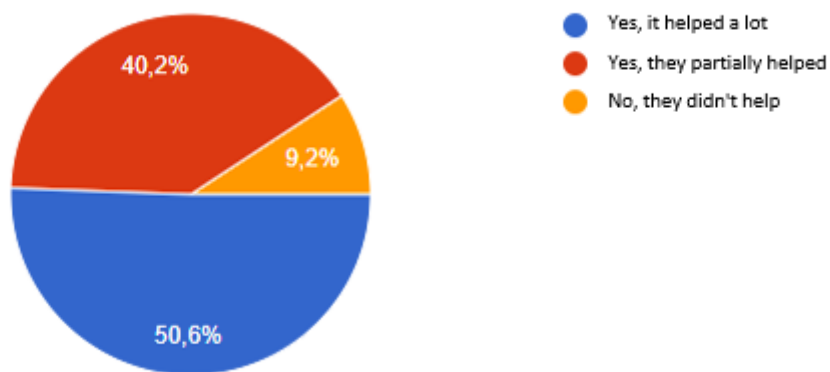
2.5. Have these measures been helpful?

Mark only one oval.

Yes, they helped a lot.

Yes, they helped partially.

No, they didn't help.



2.6. If you answered "no" or "partially" to the previous question, why?

- The course was impractical
- A lot of handwork
- Not enough knowledge
- There is no direct need to use big data
- Because I don't know where to start
- Online courses do not provide much practical knowledge
- The explanations were vague, incomprehensible

- Because I didn't understand when I took the course what I needed to know to analyze the data
- I use only Excel; I have not used other tools; I would like to try and compare; I do not have enough practice and mentoring
- There is no sense of satisfaction
- Skills are not enough
- Without practice, skills are lost
- We will see the benefits at the end because there is not enough will to finish the course when you work in parallel
- Particular tasks
- Because I have not finished the course yet, and I am not yet applying this knowledge to the extent that it is designed for
- There is not enough knowledge for analysis, and it is necessary to take training courses
- The analysis is not always primary

3.1. Why did/do you take the courses?

Mark only one oval.

for career growth

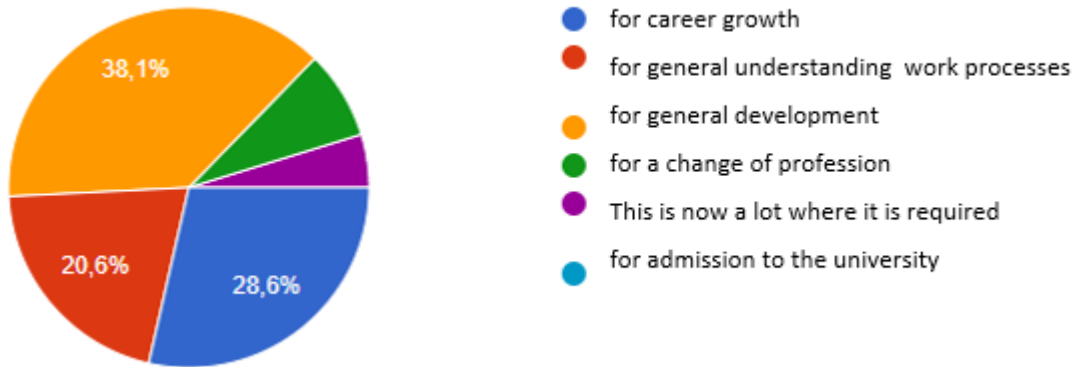
for a general understanding of work processes

for general development

to change profession

This is required in many places now

for admission to a university



3.2 Does the cost of the course justify its content?

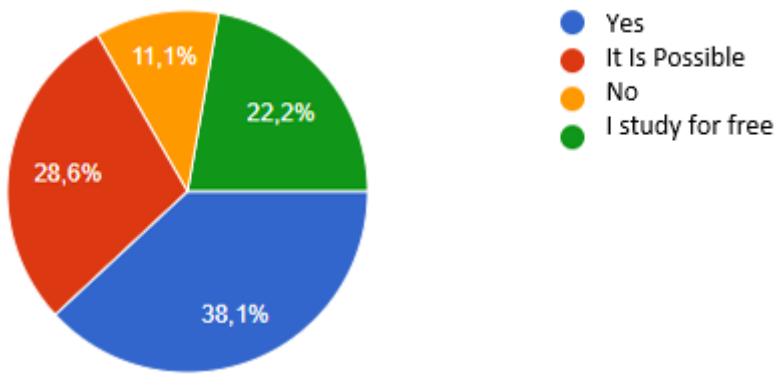
Mark only one oval.

Yes

Maybe

No

I study for free



3.3. Where and how did you take courses on data analysis?

Mark only one oval.

Online platforms (Coursera, Udemy, DataCamp, etc.)

University or educational institution

Corporate training at work

Self-study using free resources

Face-to-face courses or trainings

IT schools

Other:



3.4 How did you hear about the course?

Mark only one oval.

From colleagues or friends

Through social networks (Instagram, Facebook, etc.)

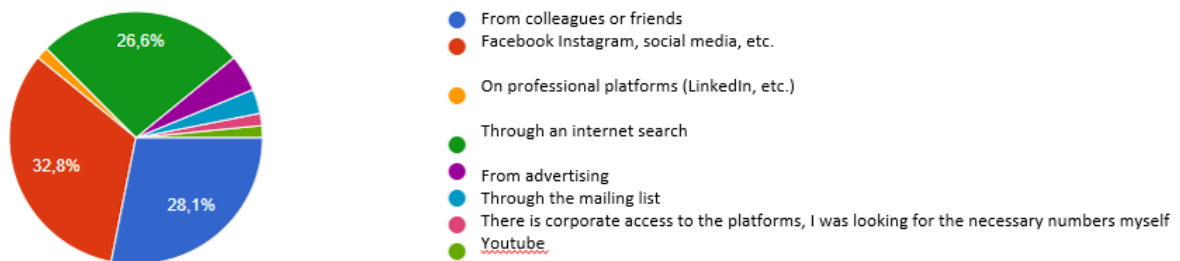
On professional platforms (LinkedIn, etc.)

Through internet search

From the advertisement

Via mailing list

Other:



3.5 What did you like about these courses?

Please select all that apply.

Availability of material

Homework

Feedback from teachers

Ability to work with real data

Community and communication between students and teachers

Assistance in employment

Certificates upon completion of the course

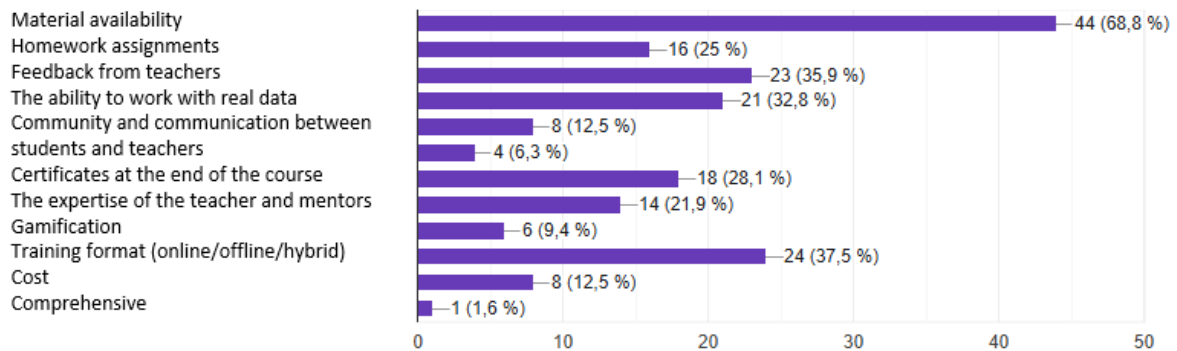
Expertise of the teacher and mentors

Gamification (elements of engagement and play)

Training format (online/offline/hybrid)

Price

Other:



3.6. What did you miss in previous data analysis courses? Or what would you like to add to these courses?

Please select all that apply.

Elements of gamification (engagement in the process and play)

Real projects and examples

Certification

Communication with other students and teachers

More detailed and in-depth explanation of topics

More engaged teachers/mentors

Flexible schedule

More time to do homework

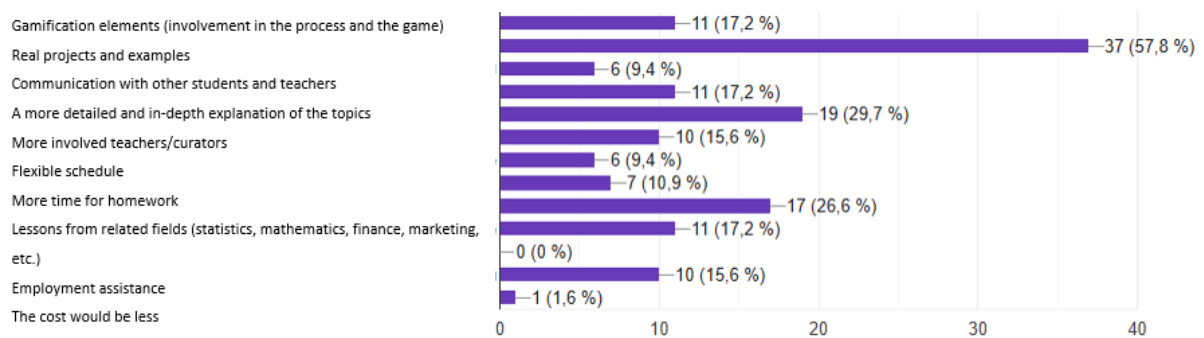
Lessons from related fields (statistics, mathematics, finance, marketing, etc.)

Assistance in employment

Change the format of training (online/offline/hybrid)

The cost could be lower

Other:



3.7. What additional topics would you be most interested in learning about in the course?

(Select all that apply)

Advanced Data Analysis Courses

Business Analytics

Web design and UX/UI

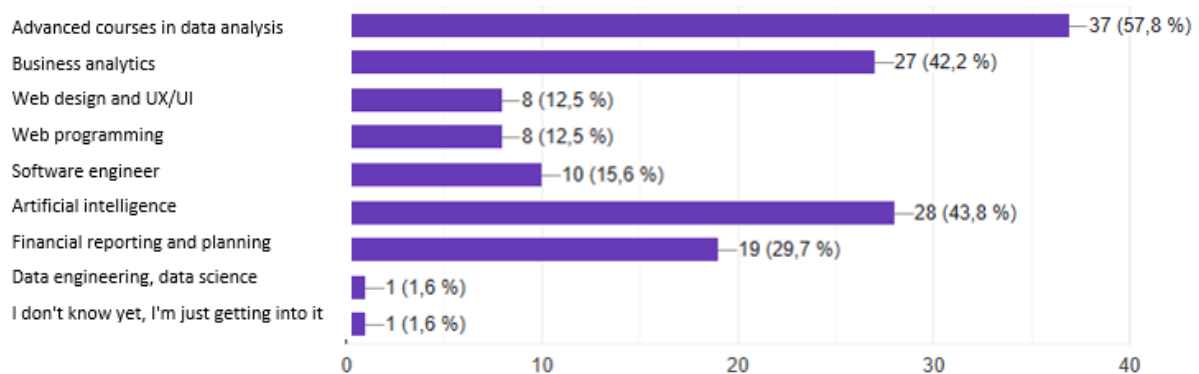
Web programming

Software engineer

Artificial intelligence

Financial reporting and planning

Other:

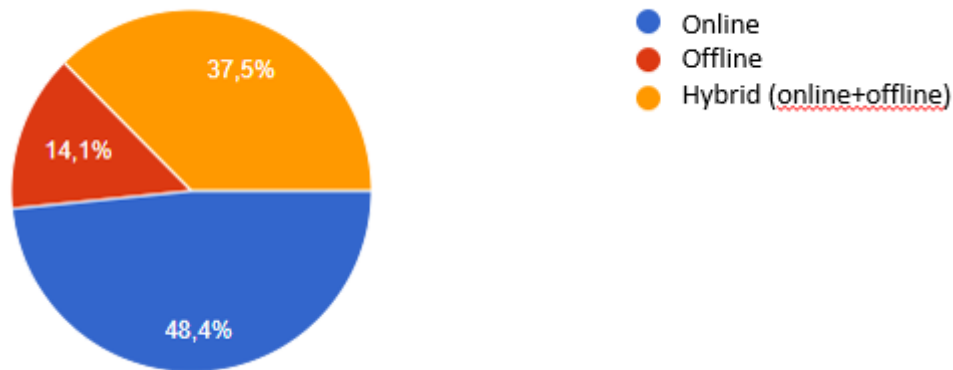


3.8. What format do you prefer to study in?

Online

Offline

Hybrid (Online + Offline)



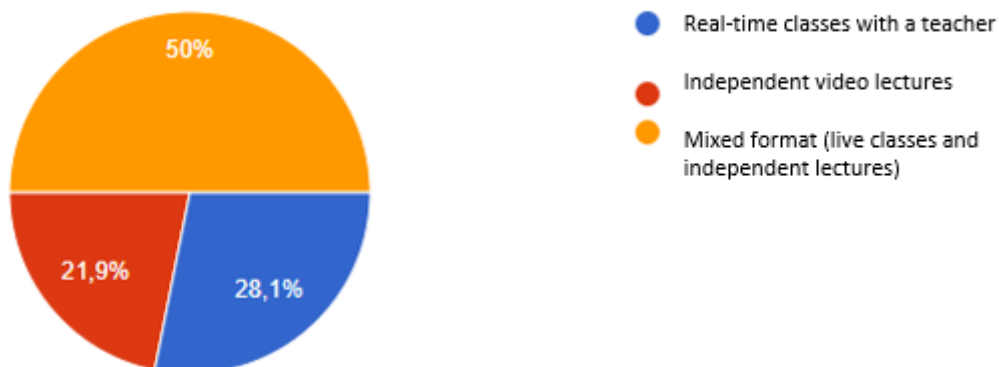
3.9 What type of training do you prefer?

Mark only one oval.

Live lessons with a teacher

Self-paced video lectures

Blended format (live classes and independent lectures)

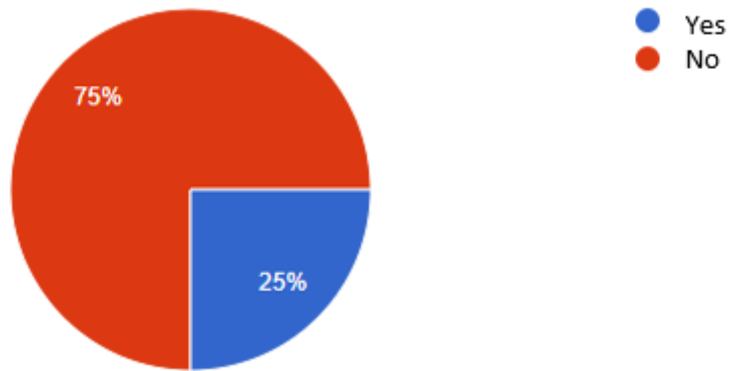


3.10. Have you taken any advanced courses in data analysis?

Mark only one oval.

Yes

No



3.11 If yes, did you feel that the advanced course(s) met your expectations?

Mark only one oval.

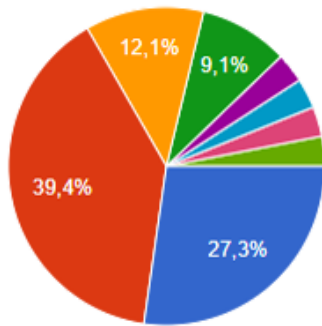
Other:

Yes, the content was deep and practical.

Partially, but there were not enough practical tasks

No, the course was not difficult enough.

Other:



- Yes, the content was deep and practical
- Partially, but there were not enough practical tasks
- No, the course was not difficult enough
- Did not pass
- The course has not been completed yet
- -
- I did not pass

3.12. Your age:

Under 18 years old

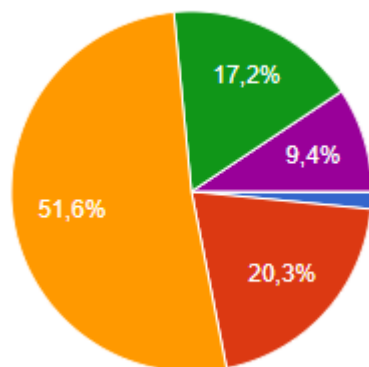
18-24 years old

25-34 years old

35-44 years old

45-54 years old

55 years and older

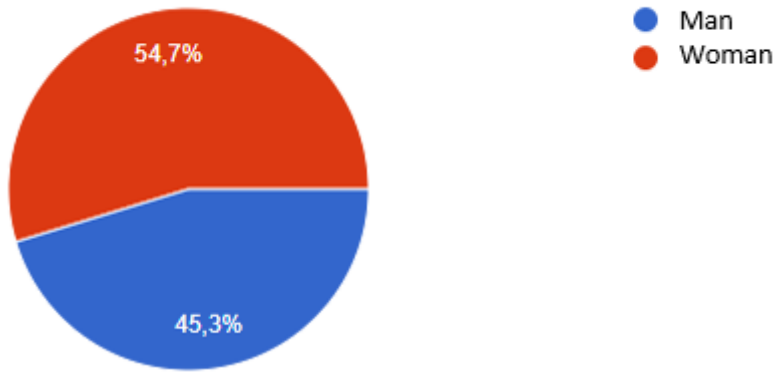


- Under 18 years
- 18-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55 and older

3.13. Your gender

Man

Woman



3.14. Your Main Employment

Other:

Information Technology

Marketing and advertising

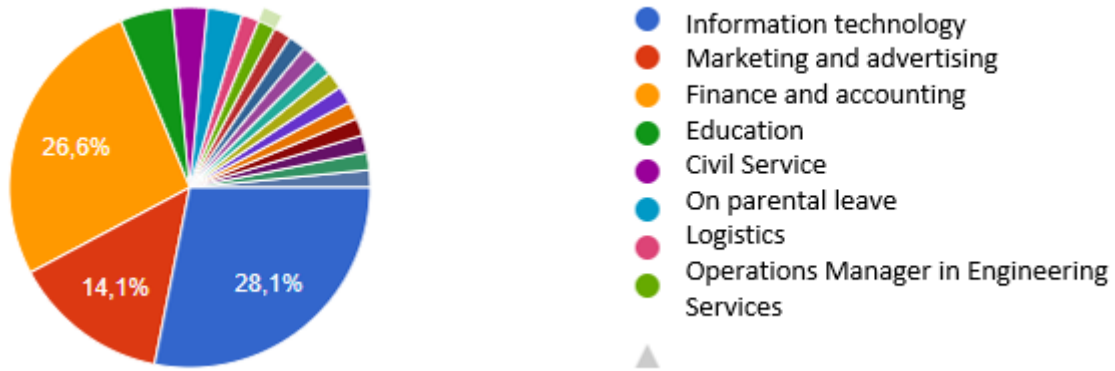
Finance and accounting

Education

Civil Service

On maternity leave

Other:



3.15. Your experience working with data

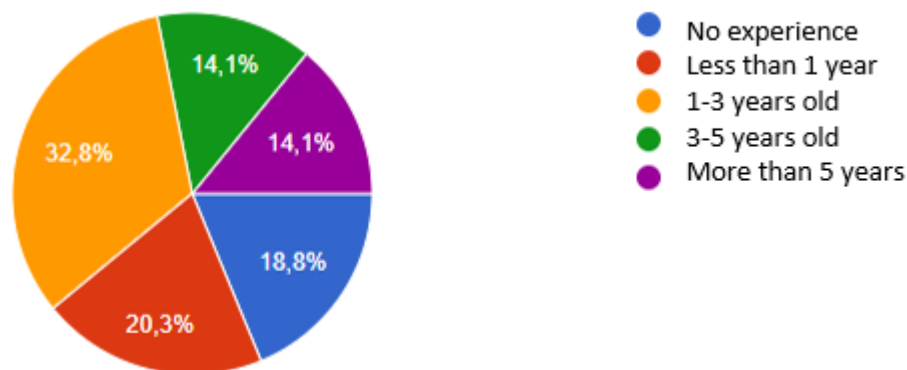
No experience

Less than 1 year

1-3 years

3-5 years

More than 5 years



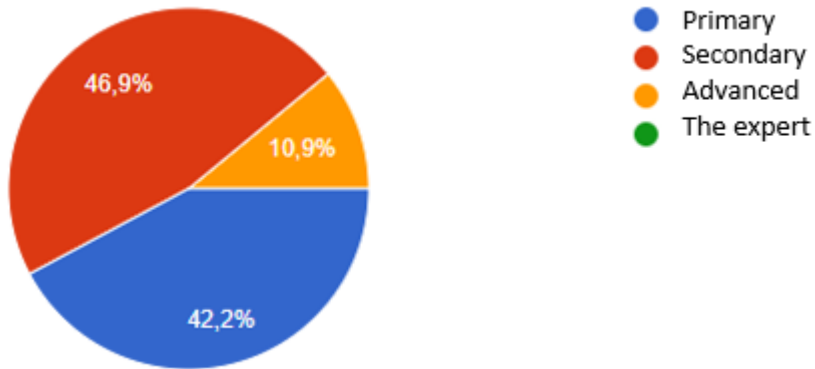
3.16. Your current level of data analysis skills:

Elementary

Average

Advanced

Expert



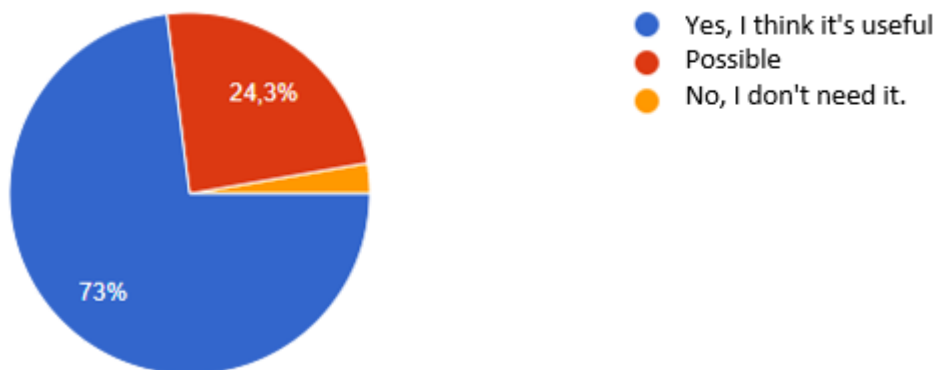
4.1 Would you like to develop your data analysis skills?

Mark only one oval.

Yes, I think it is useful.

Maybe

No, I don't need it.



4.2. If you answered "Yes" or "Maybe" to the previous question, why would you like to master data analysis skills?

Mark only one oval.

for career growth

for a general understanding of work processes

for general development

to change profession

This is required in many places now

for admission to a university



4.3. If you were offered a basic course, what format of training would be convenient for you? You can choose several answers.

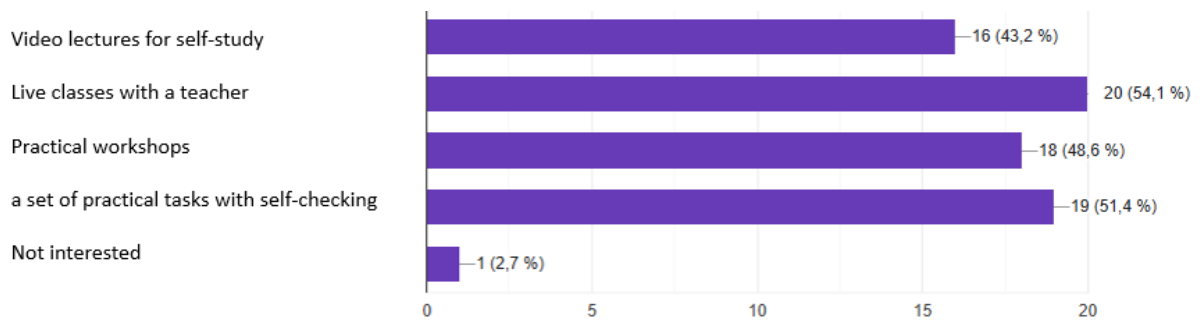
Video lectures for self-study

Live classes with a teacher

Practical master classes

a set of practical tasks with automatic checking

Not interested



4.4 If the course meets your needs, are you willing to pay for it?

Mark only one oval.

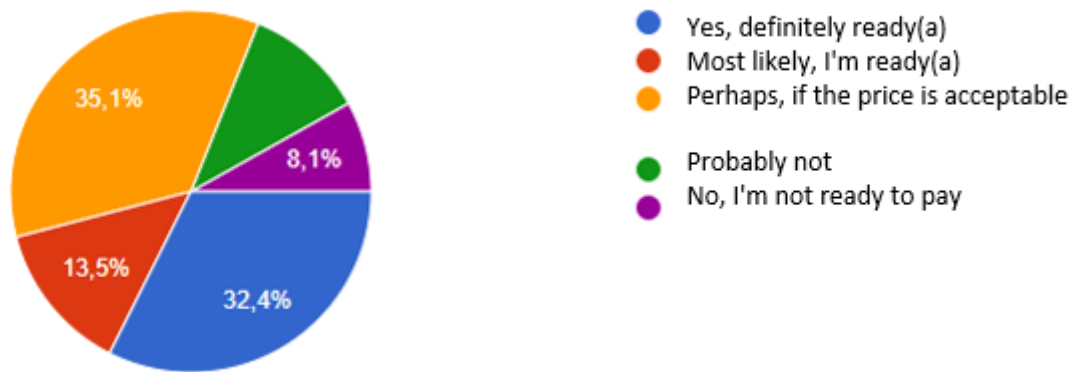
Yes, definitely ready.

Most likely ready

Perhaps, if the price is reasonable.

Most likely not.

No, I'm not ready to pay



4.5. Your age:

Under 18 years old

18-24 years old

25-34 years old

35-44 years old

45-54 years old

55 years and older

4.6 Your gender:

Man

Woman

4.7. Your main activity

Mark only one oval.

Other:

Information Technology

Marketing and advertising

Finance and accounting

Education

Civil Service

On maternity leave

Other:

Appendix N. Salaries and Requirements for Teaching IT Industry on HH

| Job Title | Requirement | Salary |
|---|-------------|-----------------------------------|
| Teacher in the field of information and communication technologies | 3-6 years | from 400,000 ₪ in hand |
| Senior Lecturer in ICT | 3-6 years | from 500,000 ₪ in hand |
| University teacher (Department of Mathematical and Computer Modeling) | 3-6 years | 650,000 ₪ before taxes |
| AI, Python and Cybersecurity Course Lecturer (9-11 grades) | 1-3 years | from 200,000 ₪ in hand |
| Manager of the educational process | 1-3 years | from 200,000 to 380,000 ₪ in hand |
| IT School Development Manager | 1-3 years | from 150,000 to 450,000 ₪ in hand |
| Teacher at IT school | 1-3 years | from 150,000 to 300,000 ₪ in hand |

| | | |
|--|-----------|--------------------------------------|
| Teacher , English, chess, IT courses, tutor . | 1-3 years | from 300,000 to 500,000 ₹ in hand |
|--|-----------|--------------------------------------|

Appendix O. Strategy. Go abroad by offering English and Russian language pre-recorded courses on basic and intermediate data analysis.

The main idea of this strategy is to translate the current course in English, including all changes that are mentioned in the main two strategies (pre-recorded videos, more practices, real cases, alumni network).

| Aspect | Risks | Benefits |
|---------------|--|---|
| Market Reach | <ul style="list-style-type: none"> - High competition in global markets from established platforms like Coursera, Udemy, and edX. - Limited awareness of ProITivity's brand outside of Kazakhstan. | <ul style="list-style-type: none"> - Access to a larger global audience, including English-speaking and Central Asian markets. - Potential for scaling revenue significantly. |
| Cost of Entry | <ul style="list-style-type: none"> - High upfront costs for course content creation and platform fees. - Revenue-sharing models reduce profit margins. | <ul style="list-style-type: none"> - Pre-existing platforms reduce the need for custom infrastructure development, lowering long-term costs. |

| | | |
|-----------------------------------|--|---|
| <p>Course Quality and Content</p> | <ul style="list-style-type: none"> - Requires significant investment in developing high-quality, engaging content. - Continuous updates to stay relevant in a competitive market. | <ul style="list-style-type: none"> - High-quality courses can establish ProITivity as a credible player, leading to long-term brand recognition and loyalty. |
| <p>Revenue Potential</p> | <ul style="list-style-type: none"> - Dependence on platform policies and commissions can limit profit margins. - Platform fees and certification charges reduce net earnings per course. | <ul style="list-style-type: none"> - Modular, project-based courses with real-world cases are attractive to a global audience and can command premium pricing. |
| <p>Operational Complexity</p> | <ul style="list-style-type: none"> - Managing courses in multiple languages adds complexity to content creation and maintenance. | <ul style="list-style-type: none"> - Using platforms like Coursera streamlines operations with integrated tools for student management, |

| | | |
|--------------------|---|---|
| | <ul style="list-style-type: none"> - Need to establish partnerships with certification providers. | <ul style="list-style-type: none"> analytics, and compliance. |
| Scalability | <ul style="list-style-type: none"> - Challenges in scaling due to reliance on external platforms. - Potential limitations on customization or branding. | <ul style="list-style-type: none"> - Scalable model through pre-recorded courses and global reach; high return once fixed costs are recovered. |
| Branding | <ul style="list-style-type: none"> - Limited ability to build a distinct brand when using established platforms. - Courses could be overshadowed by well-established competitors. | <ul style="list-style-type: none"> - Positive student experiences and certificates can build brand recognition internationally. |
| Student Engagement | <ul style="list-style-type: none"> - Pre-recorded courses may result in lower student engagement if not complemented by | <ul style="list-style-type: none"> - Flexible course structure appeals to working professionals globally, allowing them |

| | | |
|-----------------------------|--|---|
| | mentorship or interactive elements. | to learn at their own pace. |
| Compliance and Localization | <ul style="list-style-type: none"> - Need to ensure compliance with international standards and data privacy regulations. - Costs associated with localization for non-English-speaking markets. | <ul style="list-style-type: none"> - Localized courses (e.g., Russian and Kazakh) create opportunities to penetrate niche markets in Central Asia. |

Appendix P. Break-even and NPV calculations for “remain the same product” strategy aggressive marketing approach

| | |
|------------------------------|-----------|
| Breakeven calculation | 100% |
| Fixed cost | 1 427 500 |
| Variable cost (per unit) | 1 219 |
| Price per month in average | 60 952 |
| Clients per month | 25 |
| Breakeven quantity per month | 24 |

| NPV of the project (100% occupancy) | | | | | | |
|--|---|------|--------|--------|------|--------|
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
| | | 18 | | | 24 | |
| | | 285 | 20 114 | 22 125 | 338 | 26 772 |
| Revenue | | 714 | 286 | 714 | 286 | 114 |
| | | (365 | (402 | (442 | (486 | (535 |
| COS | | 714) | 286) | 514) | 766) | 442) |
| | | 17 | | | 23 | |
| | | 920 | 19 712 | 21 683 | 851 | 26 236 |
| Gross margin | | 000 | 000 | 200 | 520 | 672 |

| | | | | | | |
|-------------------------|--------|--------------------------|-----------------|-----------------|--------------------|-----------------|
| Salaries (fixed) | | (2 400 000) | (2 640 000) | (2 904 000) | (3 194 400) | (3 513 840) |
| Accountant | | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) |
| Advertising expenses | | (9 600 000) | (10 560 000) | (11 616 000) | (12 777 600) | (14 055 360) |
| Sales manager | | (2 400 000) | (2 640 000) | (2 904 000) | (3 194 400) | (3 513 840) |
| Platform expenses | | (210 000) | (231 000) | (254 100) | (279 510) | (307 461) |
| Profit before taxes | | 790 000 | 1 121 000 | 1 485 100 | 1 885 610 | 2 326 171 |
| CIT | | (158 000) | (224 200) | (297 020) | (377 122) | (465 234) |
| Net profit | | 632 000 | 896 800 | 1 188 080 | 1 508 488 | 1 860 937 |
| Investement | - | | | | | |
| Discount rate | 20,00% | <<take n from NRBK | | | | |

| | | | | | | |
|-----|-------------|-------------|--|--|--|--|
| | | websit e | | | | |
| NPV | 3 332,50 | 312 | | | | |

Appendix Q. Break-even and NPV calculations for “remain the same product” strategy corporate sales approach

| | |
|------------------------------|-----------|
| Breakeven calculation | 100% |
| Fixed cost | 1 427 500 |
| Variable cost (per unit) | 610 |
| Price per month in average | 60 952 |
| Clients per month | 25 |
| Breakeven quantity per month | 24 |

| | | | | | | |
|--|----------|---------------|---------------|---------------|---------------|---------------|
| NPV of the project (100% occupancy) | | | | | | |
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
| Revenue | | 18 285 714 | 20 114 286 | 22 125 714 | 24 338 286 | 26 772 114 |
| COS | | (182 857) | (201 143) | (221 257) | (243 383) | (267 721) |
| Gross margin | | 18 102 857 | 19 913 143 | 21 904 457 | 24 094 903 | 26 504 393 |

| | | | | | | |
|-------------------------|--------|-----------------|----------------|-----------------|-----------------|-----------------|
| Salaries (fixed) | | (2 400 000) | (2 640 000) | (2 904 000) | (3 194 400) | (3 513 840) |
| Accountant | | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) |
| Advertising expenses | | (3 600 000) | (3 960 000) | (4 356 000) | (4 791 600) | (5 270 760) |
| Sales manager | | (8 400 000) | (9 240 000) | (10 164 000) | (11 180 400) | (12 298 440) |
| Platform expenses | | (210 000) | (231 000) | (254 100) | (279 510) | (307 461) |
| Profit before taxes | | 972 857 | 1 143 322 | 1 357 706 | 2 993 128 | 2 593 892 |
| CIT | | (194 571) | (264 429) | (341 271) | (425 799) | (518 778) |
| Net profit | | 778 286 | 1 714 057 | 1 365 086 | 1 703 194 | 2 075 114 |
| Investement | - | | | | | |
| Discount rate | 20,00% | <<taken from | | | | |

| | | | | | | |
|-----|-----------------|-----------------|--|--|--|--|
| | | NRBK website | | | | |
| NPV | 3 828 387,76 | | | | | |

Appendix R. Break-even and NPV calculations for “updated course till strong junior” strategy

| | |
|------------------------------|-----------|
| Breakeven calculation | 100% |
| Fixed cost | 2 777 500 |
| Variable cost (per unit) | 811 |
| Price per month in average | 81 111 |
| Clients per month | 25 |
| Breakeven quantity per month | 35 |

| NPV of the project (100% occupancy) | | | | | | |
|--|---|---------------|---------------|---------------|--------------|--------------|
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
| | | | | | 32 | 35 |
| Revenue | | 24 333 333 | 26 766 667 | 29 443 333 | 387 667 | 626 433 |
| COS | | (243 333) | (267 667) | (294 433) | (323 877) | (356 264) |
| Gross margin | | 24 090 000 | 26 499 000 | 29 148 900 | 063 790 | 270 169 |

| | | | | | | |
|-------------------------|---|----------------|----------------|----------------|------------------|------------------|
| Salaries (fixed) | | (2 400 000) | (2 640 000) | (2 904 000) | (3 194 400) | (3 513 840) |
| Accountant | | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) | (2 520 000) |
| Advertising expenses | | (4 200 000) | (4 620 000) | (5 082 000) | (5 590 200) | (6 149 220) |
| Case designer | | (6 000 000) | (6 600 000) | (7 260 000) | (7 986 000) | (8 784 600) |
| Platform expenses | | (210 000) | (231 000) | (254 100) | (279 510) | (307 461) |
| | | | | | | |
| Profit before taxes | | 8 760 000 | 9 888 000 | 11 128 800 | 12 493 680 | 13 995 048 |
| CIT | | (1 752 000) | (1 977 600) | (2 225 760) | (2 498 736) | (2 799 010) |
| Net profit | | 7 008 000 | 7 910 400 | 8 903 040 | 9 994 944 | 11 196 038 |
| Investement | - | | | | | |

| | | | | | | |
|---------------|------------------|-------------------------------------|--|--|--|--|
| Discount rate | 20,00% | <<take n from NRBK website | | | | |
| NPV | 25 805 084,88 | | | | | |

Appendix S. Break-even and NPV calculations for “updated course till strong junior” strategy with internships for students via partnering with companies.

| | |
|------------------------------|-----------|
| Breakeven calculation | 100% |
| Fixed cost | 1 977 500 |
| Variable cost (per unit) | 835 |
| Price per month in average | 83 511 |
| Clients per month | 25 |
| Breakeven quantity per month | 24 |

| NPV of the project (100% occupancy) | | | | | | |
|--|---|---------------|---------------|---------------|------------------|------------------|
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
| Revenue | | 25 053 333 | 27 558 667 | 30 314 533 | 33 345 987 | 36 680 585 |
| COS | | (250 533) | (275 587) | (303 145) | (333 460) | (366 806) |

| | | | | | | |
|----------------------|--|--------|--------|--------|------|------|
| | | | | | 33 | 36 |
| | | 24 802 | 27 283 | 30 011 | 012 | 313 |
| Gross margin | | 800 | 080 | 388 | 527 | 779 |
| | | | | | (3 | (3 |
| | | (2 400 | (2 640 | (2 904 | 194 | 513 |
| Salaries (fixed) | | 000) | 000) | 000) | 400) | 840) |
| | | | | | (2 | (2 |
| | | (2 520 | (2 520 | (2 520 | 520 | 520 |
| Accountant | | 000) | 000) | 000) | 000) | 000) |
| | | | | | (5 | (6 |
| | | (4 200 | (4 620 | (5 082 | 590 | 149 |
| Advertising expenses | | 000) | 000) | 000) | 200) | 220) |
| | | | | | (3 | (4 |
| | | (3 000 | (3 300 | (3 630 | 993 | 392 |
| Case designer | | 000) | 000) | 000) | 000) | 300) |
| | | (210 | (231 | (254 | (279 | (307 |
| Platform expenses | | 000) | 000) | 100) | 510) | 461) |
| | | | | | | |
| | | | | | 17 | 19 |
| | | 12 472 | 13 972 | 15 621 | 435 | 430 |
| Profit before taxes | | 800 | 080 | 288 | 417 | 958 |

| | | | | | | |
|---------------|------------------|------------------------------------|----------------|----------------|---------------|---------------|
| | | | | | (3 487 | (3 886 |
| CIT | | (2 494 560) | (2 794 416) | (3 124 258) | 083) | 192) |
| Net profit | | 9 978 240 | 11 177 664 | 12 497 030 | 13 948 333 | 15 544 767 |
| Investement | - | | | | | |
| Discount rate | 20,00% | <<taken from NRBK website | | | | |
| NPV | 36 283 264,43 | | | | | |