Assessment 3 _ Group report Medical Group

Commercial analysis part

CS551H _ Natural Language Generation
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Kindly note the commercial analysis is written in 3000-4000 words as indicated in the assignment question. The word counts are not specified to the prototype and are not included in the previous count.
Our commercial analysis is 3364 words.

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Commercial Analysis for EzyMed Inc.

1. Vision and Scope:

Understanding medical information can be a daunting task for patients, especially when they are trying to navigate complex medical terminologies and treatment options. Moreover, it can be time-consuming for doctors to explain all the details of the diagnosis and treatment plan to each patient during a limited appointment time, leading to reduced efficiency and longer wait times for patients.

Our company aims to address this issue by providing a software solution that simplifies and streamlines the communication of medical information between doctors and patients. Our software uses natural language processing to analyze and interpret medical data and generate patient-friendly reports that explain the diagnosis, treatment plan, and other relevant medical information. By providing this service, we aim to save doctors time, improve patients' understanding of their health situation, and ultimately improve the overall quality of care.

In addition, our software can generate reports that are customized for individual hospitals and clinics, providing tailored solutions that meet their specific needs. This customization also allows for continuous feedback and improvement based on user input, ensuring that our software remains up-to-date and relevant in an ever-evolving healthcare landscape.

Figure 1. Logo and slogan of our company.

1.1. About us:

In 2023, a group of passionate individuals from the medical and technology sectors met at the University of Aberdeen with the goal of improving patients' lives. They recognized the need for personalized health information and created a rule-based natural language generation (NLG) platform to generate personalized medical reports for patients.

Our Slogan:

> "Your personalized health report, written just for you."

Mission Statement:

> "Our mission is to empower patients with personalized medical reports, improving patient education, engagement, and adherence to treatment plans. We strive to reduce the workload of healthcare providers, improve patient outcomes, and ensure compliance with industry standards and regulations."

Vision Statement:

"Our vision is to become the leading provider of personalized medical reports, revolutionizing the way patients receive and understand their health information. We aim to be a trusted partner for healthcare providers, helping them deliver high-quality, patient-centered care that improves outcomes and reduces costs."

Values

Figure 2. Our company values.

- Patient-centric focus: We prioritize the patient's needs, experiences, and outcomes in everything we do.
- Accuracy and safety: We are committed to maintaining the highest standards of accuracy and safety in our medical reporting platform, ensuring that patients receive reliable and trustworthy information.
- Integrity: We operate with honesty, transparency, and ethical principles, building trust with our patients and healthcare partners.
- Simplicity: We aim to make our medical reports accessible and understandable for all patients, regardless of their health literacy level, by keeping our platform simple and easy to use.
- Social responsibility: We believe that healthcare is a basic human right and are committed to making our platform accessible to all patients, regardless of their ability to pay. We also prioritize data privacy and security to protect patient information.

1.2. Our Products

A- EzyMed^{TM}

Our NLG-powered medical reporting software is designed to make the process of generating medical reports faster, more accurate, and more convenient for doctors. With our software, doctors can easily generate customized reports for their patients that include all the necessary information, such as the patient's medical history, examination results, diagnosis, treatment plan, and medication prescription.

Our software uses the latest NLG technology to analyse and interpret the data entered by the doctor and generate a comprehensive, easy-to-read report that can be printed or shared with the patient electronically. This eliminates the need for doctors to spend valuable time writing reports and ensures that the reports are consistent and accurate across different departments.

Our software is also highly secure, ensuring that patient data is always protected. We provide regular updates and support to ensure that the software remains up-to-date and effective in meeting the needs of doctors and hospitals.

B- Future product:

Our automated medical reporting system, powered by state-of-the-art machine learning technology alongside a rule-based NLG system, takes the burden of report writing off doctors, allowing them to focus on what matters most - their patients. By leveraging the vast amount of medical data and doctor's notes, our system generates highly accurate, detailed, and comprehensive reports that meet the specific needs of each patient. The use of machine learning ensures that the reports are consistent and of high quality, and the integration with EHRs makes the process seamless and effortless for doctors. With our system, hospitals and clinics can greatly improve their operational efficiency and provide patients with better care.
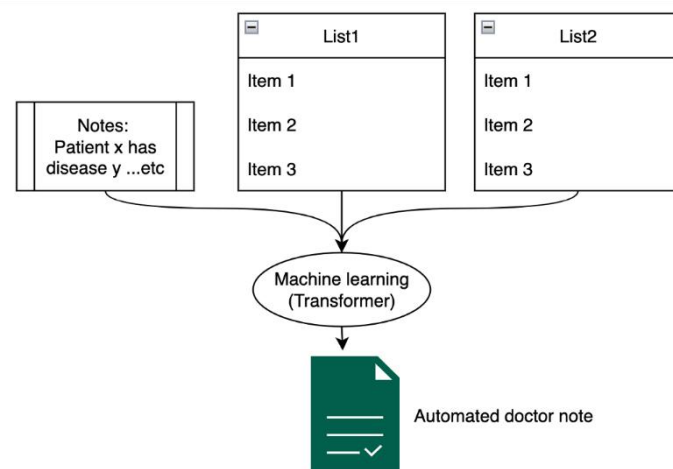

Figure 3. Future product plan.

How our products help you?

- Time-Saving: Healthcare providers often spend a significant amount of time creating patient education materials and explaining treatment plans to patients. A customized medical report generated by a rule-based NLG system could help reduce the time healthcare providers spend on patient education, freeing up their time to focus on other aspects of patient care.
- Improved Patient Satisfaction: Providing patients with a customized medical report can help them feel more informed and engaged in their care, leading to increased patient satisfaction. This, in turn, can improve patient retention and referrals to healthcare providers.
- Better Adherence: Patients who are well-informed about their health conditions and treatment plans are more likely to adhere to their medication and lifestyle recommendations. By providing

patients with customized medical reports, healthcare providers can help improve patient adherence and outcomes.

- Compliance: Patient education is an important aspect of healthcare compliance. By providing patients with a customized medical report, healthcare providers can demonstrate that they are complying with industry regulations and standards, improving their overall compliance, and reducing their risk of legal and regulatory issues.
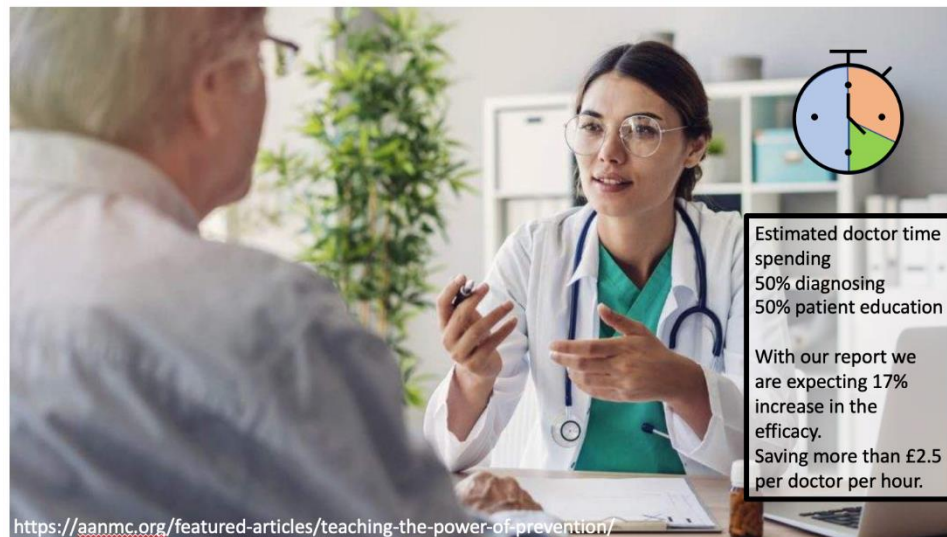

Figure 4. Our product increases our customer efficacy increasing their number of visits per hour.

1.3. Our technology and collaborations:

Our technology utilizes rule-based natural language generation (NLG) to automatically generate customized medical reports based on patient data given by doctors. By using a set of predefined rules and templates, our NLG engine can analyse the patient's symptoms, medical history, and test results to generate a clear and concise report that summarizes the patient's condition and recommended treatment plan. This technology reduces the time and effort required for doctors to write reports manually and increases accuracy and consistency across the hospital. Additionally, our software is designed with the end user in mind, making it user-friendly and easy to integrate into existing hospital systems.

Our collaborations with Arria Studio, EHR vendors, pharmaceutical companies, health insurers, and government agencies offer significant opportunities for growth and impact in the healthcare industry. By leveraging Arria Studio's NLG technology and partnering with key players in the healthcare ecosystem, our platform can improve patient outcomes and increase satisfaction, while expanding its reach and relevance. Additionally, our focus on patient-centered outcomes and education enhances the overall healthcare experience, increasing the value proposition of our platform and positioning us for long-term success in the market.

Figure 5. Our potential collaborators.

2. Market analysis:

What are the market size and the target market? And how we are planning to reach it?

Based on our research, there are 1257 hospitals in the UK ([1](#)) and the UK healthcare market has a potential annual market size of over £8 million, assuming each hospital generates an average of 100 reports per day. Our pricing model of £0.2 per report is competitive and reasonable. We plan to initially target NHS hospitals and eventually expand to private hospitals and clinics. Additionally, with 6,495 GP practices in England as of 2022 ([2](#)), the potential for market size growth is enormous, presenting an exciting opportunity for investors looking to invest in a company that is at the forefront of innovation in healthcare.

Our pricing strategy for EzyMed Inc. focuses on a per-report model, allowing us to tailor our services to each hospital's unique data structure and storage needs. We recognize that a one-time purchase pricing strategy is not ideal, and a subscription-based model may be too costly for small hospitals and practices. By offering our services at a cost ranging from £0.1-0.2 per a report, we are making our platform accessible to smaller hospitals and practices, expanding our customer base, and establishing ourselves as a dominant player in the market. Although this pricing strategy does not provide predictable income, it allows us to gain rapid market share and become a leader in the healthcare industry. In the table below we show a potential pricing strategy, in which we consider the average daily attendance of patients, this gives us a more effective way to reach even the largest hospitals in the country.

Table 1. Pricing and offer strategy:

Number of Patients per Month	Price per Report (GBP)
Up to 100	0.2
101 - 500	0.15
501 - 1000	0.12
Over 1000	0.1

Our distribution strategy will leverage both direct sales and partnerships with medical software distributors to maximize our reach and impact in the market. Direct sales will enable us to establish direct relationships with customers and maintain greater control over our brand, while partnerships with medical software distributors will help us access a larger initial audience and leverage existing relationships with hospitals and healthcare providers. We plan to gradually shift towards direct sales as we grow and establish our brand to build long-term customer relationships and increase our control over the sales process. This strategy is aimed at achieving maximum market penetration and long-term success.

Other market considerations:

Our product aligns well with current healthcare industry trends and drivers, such as the need for cost-cutting and increased efficiency, personalized medicine, and regulatory compliance. Our rule-based natural language generation technology is cutting-edge and can generate customized reports for each patient.

Furthermore, our product can seamlessly integrate with electronic health records systems, helping healthcare providers comply with regulations and improve the accuracy of the reports.

Our company prioritizes patient privacy and data protection, and we have taken measures to ensure that sensitive information remains secure. Our software can generate reports on-site in hospitals, reducing the need for online data sharing or an internet connection. We are also considering developing a mobile app for patients who prefer to access their reports on their devices. The app will feature multiple layers of security, including encrypted access and the removal of personal information from uploaded reports. In the event of a data breach, the report will contain only anonymous information, protecting patient privacy.

Our focus on customer needs and preferences is a key aspect of our product strategy. We have developed a customization approach that enables us to tailor our software to the specific requirements of each hospital and gather valuable feedback for further improvements. By prioritizing customer satisfaction and continuously refining our product, we aim to establish a strong reputation in the healthcare industry and achieve sustained success.

3. Competitors analysis:

Who are our potential competitors:

Although there are no direct competitors, we have indirect ones who can be categorized into three groups:

a) Companies that give data access to the patients: These companies, such as Epic Systems, Cerner Corporation, Allscripts Healthcare Solutions, Inc., McKesson Corporation, and Athenahealth, Inc., provide patients with access to their health data but do not generate patient reports. Epic Systems is the most relevant competitor in this category, as they have a report generation capability but do not use it for patients, unlike our proposed product. These companies focus is on electronic health records and patient data management.

b) Telehealth tool companies: Companies like Oracle, Cerner, and Cliniko are focused on improving patient engagement and care using telehealth tools, such as video consultations. While not direct competitors, they are similar in their efforts to improve patient outcomes and engagement.

c) Healthcatalyst and Twistle: Healthcatalyst's Twistle software improves healthcare communication with patients using SMS messages. These messages can contain health data, reminders, and educational videos. While Twistle is not a direct competitor in terms of report generation, its focus on patient communication and education is like our proposed product.
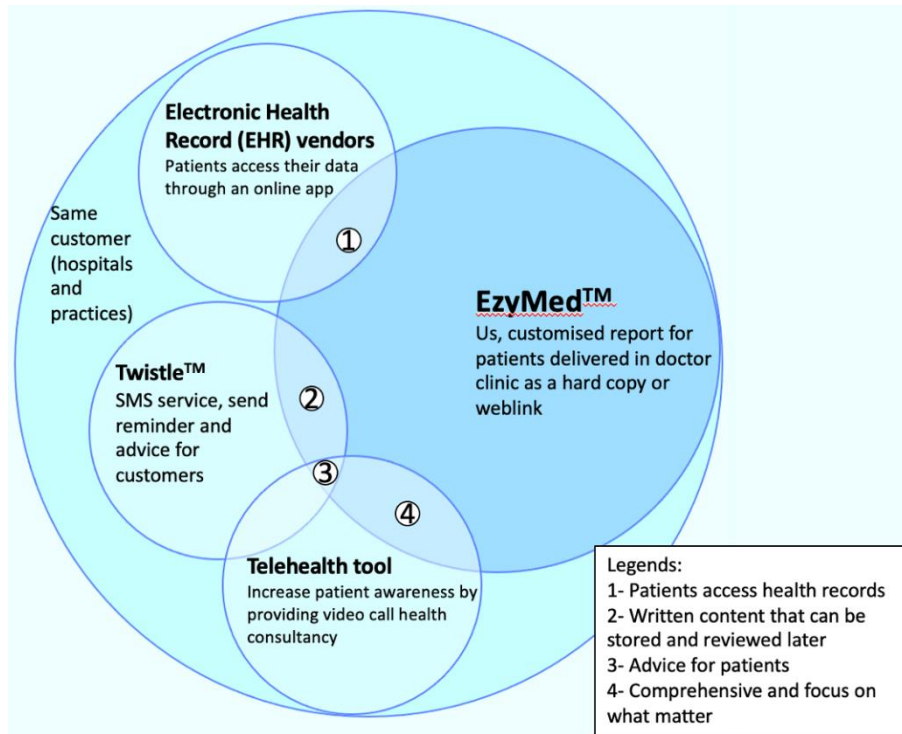
Figure 6. Shared market segments with competitors and our unique position.

Analysing our position in the market:

Table 2. SWOT analysis for our business:

Strengths	Weaknesses
1. A competitive position (our software is customized to hospital needs).	1. Niche area (limiting brand recognition).
2. Team with a range of skills (Business, healthcare, data science, and computer engineering).	2. Depends on one financial resource stream and additional costs for customization.
3. Accurate report in a short time created on spot (Efficient and reliable).	3. New in the market harder to establish credibility and gain traction.
4. Strong consideration for patient privacy and security (Align well with regulation).	4. Reliance on one main product (vulnerable to changes in market demand)
Opportunities	**Threats**
1. Growing demand for technology-based solutions in the healthcare industry.	1. Existence of companies that have or can develop this capability like health data management companies.
2. Potential to expand our product offerings reports for health care specialists.	2. The fast change in technology could render our product obsolete or less relevant.
3. Pricing strategy that suits small and big hospitals (wide potential exposure).	
4. Growing trend towards patient-centered healthcare.	

Overall, your focus on patient report generation and customization, along with your commitment to security and compliance, position us well in the market. However, it will be important to remain vigilant about competitive threats and changing industry dynamics to remain successful over the long term.

Staying ahead of competitors:

As we move forward, we plan to maintain our competitive edge in the market by continuing to focus on our customization approach with hospitals. This approach allows us to provide continuous feedback, which in turn helps us to improve our work and meet the unique needs of each hospital. In addition to this, we plan to expand our report-generation capability to make products that target doctors, pharmacists, nurses, and other healthcare professionals. Our aim is to provide a comprehensive solution that meets the needs of the entire healthcare team.

To further strengthen our position in the market, we plan to develop strategic partnerships. One such partnership will involve working with software distributors to build direct relationships with customers. This approach will enable us to better understand the needs of our customers and work collaboratively to meet them. We are also committed to investing in research and development, and we have already started collaborating with the University of Aberdeen to explore new opportunities and improve our capabilities. Our goal is to stay committed to our values of improving patient lives.

In terms of marketing, we are offering a free trial of our product, which will allow hospitals to test and try our product before committing to it. We are also hosting webinars to provide hospitals with more information about our product and how it can benefit their patients. Through these efforts, we are confident that we can build a strong customer base and maintain a competitive edge in the market.

4. Cost analysis:

For the first 3 years, we are focused on testing the product with 10 to 15 hospitals each year assuming we retain 100% of our customers each year. This gives us a rough idea to start our cost analysis, we 5 are the sole employees in the company and plan to work part-time for the first year and commit once we have a firm ground to stand on. We see that in the first 3 years, we will not be able to turn a profit as a result of our highly competitive pricing, but once we start reaching the high 2Mil reports per year, we start easily making a profit and that too exponentially. The table and the graph below give scenarios with a lower and upper bound on cost estimate with respect to the potential generation of reports.

We also list our potential market share each year, assuming 1200 hospitals in the UK and no new hospitals open or no hospitals close, in five years' time we estimate we could take 5% to 8% of the market share. This is very realistic as we have put strict constraints on our estimations, these strict constraints take into account any unexpected challenges we may face, and our business model will be reviewed each year to reassess our pricing and cost model to better suit our current and future state.

To meet our negative financial situation we plan to take loans three times, assuming the worst-case scenario, 50k in the first year, 100k in the second year, and 50k in the third year, taking loans separately allows us to strictly assess our situation, and formulate comprehensive economic plans, these loans can easily be repaid even in the worst case scenarios in the coming years.

Table 3. detailed cost analysis:

Year	0	1	2	3	4	5
Labour	$50,000	$150,000	$150,000	$150,000	$200,000	$250,000
Equipment (including hardware for developers)	$6,000	$3,000	$5,000	$6,000	$7,000	$8,000
Software tools and licensing fees	$2,000	$4,000	$4,000	$4,000	$4,000	$4,000
Rent/mortgage for production facility	$25,000	$25,000	$25,000	$25,000	$30,000	$30,000
Utilities (electricity, water, internet, etc.)	$5,000	$10,000	$10,000	$10,000	$13,000	$13,000
Marketing and advertising	$5,000	$7,000	$7,000	$10,000	$10,000	$10,000
Legal and professional services	$2,000	$4,000	$4,000	$4,000	$4,000	$4,000
Other expenses	$2,000	$4,000	$4,000	$4,000	$4,000	$4,000
Unexpected cost	$20,000	$25,000	$30,000	$30,000	$30,000	$30,000
The total cost of production	$117,000	$232,000	$239,000	$243,000	$302,000	$353,000
Minimum Number of reports generated	360,000	720,000	1,080,000	1,404,000	1,825,200	2,372,760
Cost per report	$0.33	$0.32	$0.22	$0.17	$0.17	$0.15
Selling price per report	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20
Profit margin per report	-$0.13	-$0.12	-$0.02	$0.03	$0.03	$0.05
Sales	$72,000.00	$144,000.00	$216,000.00	$280,800.00	$365,040.00	$474,552.00
Profits	-$45,000	-$88,000	-$23,000	$37,800	$63,040	$121,552
Tax (19%)	0	0	-$4,370	$7,182	$11,978	$23,095
Net profit	-$45,000	-$88,000	-$18,630	$30,618	$51,062	$98,457
Maximum Number of reports generated	540000	1,080,000	1,620,000	2,106,000	2,737,800	3,559,140
Cost per report	$0.22	$0.21	$0.15	$0.12	$0.11	$0.10
Selling price per report	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20
Profit margin per report	-$0.02	-$0.01	$0.05	$0.08	$0.09	$0.10
Sales	$108,000.00	$216,000.00	$324,000.00	$421,200.00	$547,560.00	$711,828.00
Profits	-$9,000	-$16,000	$85,000	$178,200	$245,560	$358,828
Tax (19%)	0	-$3,040	$16,150	$33,858	$46,656	$68,177
Net profit	-$9,000	-$12,960	$68,850	$144,342	$198,904	$290,651
Total hospitals in the UK	1200	1200	1200	1200	1200	1200
Minimum number of contracts (hospitals)	10	20	30	39	51	66
Minimum market share	0.83%	1.67%	2.50%	3.25%	4.23%	5.49%
Maximum number of contracts (hospitals)	15	30	45	60	78	101
Maximum market share	1.25%	2.50%	3.75%	5.00%	6.50%	8.45%

* Labour (including software engineers, data analysts, and quality assurance personnel), ** Other expenses (including insurance, transportation, and office supplies) *** Before we become profitable: minimum growth rate (+10 hospitals per yea/ 100 patients per hospital per day) while the maximum is +15 hospitals per year. After we became profitable the growth rate was assumed to be +30% per year.
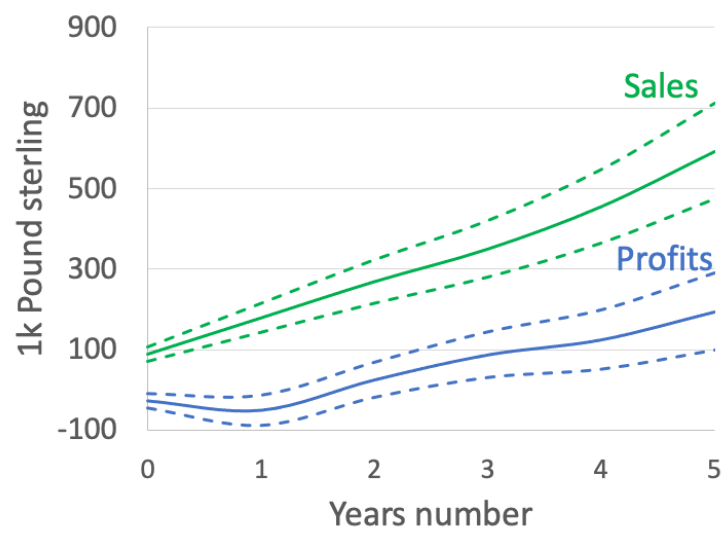
Figure 7. Our estimated sales and profits in the first five years.

Table 4. Loan plan for the next ten years:

Loan Term	Total Amount Paid	Yearly payment
10 years	£237,323.13	£23,733

5. Summary:

Our product offers a unique and highly efficient solution for generating patient reports in the healthcare industry. Our team has developed software that is customized to meet the specific needs of each hospital, ensuring accurate and reliable results in a short amount of time.

We have conducted market research and identified three categories of indirect competitors, but none of them offer the same capabilities as our product. This gives us a strong competitive advantage and a unique position in the market.

Our business model is designed to be flexible and adaptable, allowing us to work with hospitals of all sizes and types. Instead of selling our product upfront, we offer it to hospitals on a per-report basis, providing a cost-effective solution that ensures both parties are aligned in their goals. We have a clear roadmap for growth and expansion, including plans to develop additional product offerings that target healthcare professionals. We are also exploring strategic partnerships with software distributors to build direct relationships with our customers and better understand their needs.

Overall, we believe that our product has the potential to transform the healthcare industry by providing efficient, reliable, and customizable patient reports. We are committed to staying ahead of the competition and investing in our continued growth and success.