“InTruth”

Mobile app to check the facts on the news you read

Final Capstone Project

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KSE | Business Education

TABLE OF CONTENTS

ABSTRACT

Kyiv School of Economics
Faculty of Business Education

Master's in Digital Transformation and Business Analytics

"InTruth"

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"InTruth" is a mobile application and analytical system that allows users to check facts quickly on the news they read every day. With this application, users can check news from any source that is convenient for them (messengers, social networks, online media resources).

We collaborate with top gactcheking organizatons and use natural language processing and AI semantic search to find most relevant information so that the user can easily verify information.The design focuses on the user's request and allows him to check information without pushing him to leave his regular news consumption flow.

The application concentrates on the USA and UK markets with a focus on young socially active Internet users. The application by itself is free and distributed through the App Store. The main source of income is contextual native advertising.

Our Vision

"Help people make decisions in their lives based on facts, not fakes"

Our Mission

"Use innovation technologies to help people easily recognize fakes
on the information they read every day."

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to Kyiv School of Economics and Faculty of Business Education. You are doing the right thing in the right place.

CHAPTER 1. BUSINESS CONTEXT

1.1 Problem statement

The main problems for the solution of which this application is created can be briefly described as:

- Increase of fake information and active distribution through social networks.
- Complication of verifying facts due to the increase of the amount of information consumed by people daily.
- Manipulation of people's opinions and their political views by spreading misinformation through media resources.

In light of the recent attention to the role of social media in spreading fake news about current political and social issues, it is important to understand how the audience interacts with disinformation on social networks.

Fake news about current social or political issues is circulated on social media with tremendous speed. These fake stories or hoaxes – deliberately or not – misinform or deceive audiences. Usually, these stories are created to either influence people's views, push a political agenda or cause confusion and can often be a profitable business for online publishers. Fake news stories can deceive people since their sources are mainly using names and web addresses similar to reputable news organizations. There are also cases where fake news is produced by mistake, but it might also confuse and mislead audiences.

Many people consume news and are informed about current political and social events from social media platforms and networks and it can often be difficult to tell whether stories are credible or not. Information overload and a general lack of understanding of how the internet works, have also contributed to an increase in fake news or hoax stories. Both social media and users can play a big part in increasing the spread of these types of stories. [1.1,1]

The spread of fake news on the Internet is a cause of great concern for all members of society, including the government, politicians, organizations, businesses, and citizens. Fake news is specifically designed to plant a seed of mistrust and escalate the existing social and cultural dynamics by misusing political, regional and religious undercurrents. Fake news has an adverse impact on individuals and society as it deliberately persuades consumers to accept false beliefs that are shared to forward specific agendas.

The circulation of fake news poses significant challenges for organisations and brands. In fact, fake news that promotes a specific viewpoint or opinion about a product, brand or organisation, which may not be true, can be deliberately designed to mislead consumers. For example, consumers threatened to boycott McDonald's after the fake news regarding its use of ground worm filler in its burgers became viral. [1.1,2]

In addition, ahead of the 2016 presidential election, the top 20 fake stories received more shares, reactions, and comments (8.7 million posts) than the top 20 real news (7.3 million posts), according to NPR. [1.1,3]

Social media drives more users to fake news sites than real ones. More than 40% of visits to 65 fake news sites come from social media when compared to about 10% of visits to 690 top US news sites, according to a 2017 study in the Journal of Economic Perspectives. [1.1,4]

According to research by Andrew Hess of Princeton, Brendan Nyhan of Dartmouth University, and Jason Reifler of Exeter University, more than a quarter of voting-age in the final weeks of the 2016 campaign adults visited a fake news website supporting Hillary Clinton or Donald Trump.

“There is a huge menagerie of misinformation. This is especially insidious because it undermines the legitimacy of mainstream news, ”said David Lazer, who studies the impact of the Internet on citizens and their elected officials. [1.1.5]

Thus, fake news and its viral spread have become a major problem in the age of social media, where wide anonymity, the content generated by users, and geographic distance can stimulate the spreading of fake news.

1.2 Idea description

Main idea is to create an application that can simplify our process of fact checking. With the power of Big Data and AI prevents disinformation spreading. That tool will reduce the distance between fake news and refutation from fact checking organizations.

“InTruth” is a smartphone application and analytic framework that enables users to easily double-check information in the news they read on a daily basis. Users can check news from any source that is convenient for them (messengers, social networks, online media resources). The design focuses on the user's request and helps him to check information without having to leave his usual news sources.

You are reading your feed and some news from your favorite sources. Once you see some information that seems fake for you and you have some doubts about this truthfulness. You just click the share button on your phone and send this article to our application.

Our application will process the news and return you all information and summaries of top relevant posts from the fact-checking organizations and verified resources that indicate whether this news is true or fake. We use an analytical system based on AI technologies (NLP, GPT3 model) to find and select the most relevant information for the user's request. You can quickly verify the information and get back to your flow.

1.3 Vision and mission

For better understanding of the purpose of this product we created a vision and mission that reflect our main values and goals.

Vision

"Help people make decisions in their lives based on facts, not fakes"

Our ultimate goal and vision are to prevent the spreading of misinformation and ease the process of fact-checking for our users. We want to make the process of fact-checking accessible and fast for all people so they can differentiate misinformation and form their understanding of the surrounding world based on real facts and not on disinformation. Only if people will obtain real facts and real information will they be able to make conscious decisions related to their lives and their loved ones. We wish to provide access to trustworthy information that will enhance civic discourse and protect democratic debate and process.

Mission

"Use innovation technologies to help people easily recognize fakes
on the information they read every day."

We wish to achieve our goal through using advanced technologies which will help people to reach important relevant information from top fact-checking organizations. This is our mission, and we are inspired to use the power of artificial intelligence and new technologies to provide our users with facts and help them to detect fakes in news they read every day.

CHAPTER 2. MARKET ANALYSIS

2.1 Macro analysis

For macroeconomic analysis I will use PESTEL analysis to overview the market from different perspectives: Political, Economical, Social, Technological, Environmental and Legal environments.

2.1.1 Social Environment. Coronavirus impact

The coronavirus crisis has significantly increased news consumption by mainstream media in all countries before and after the pandemic took effect, according to a study by Digital News Report. There has been a significant uptick in TV news and online sources, and more and more people see television as their main source of news, providing a pause after a steady decline.

The consumption of print newspapers has fallen as restrictions undermine their physical distribution, which will almost certainly accelerate the transition to a fully digital future.

At the same time, the use of the Internet and social media has expanded significantly in most countries. WhatsApp showed the largest growth overall, by about ten percentage points in some countries, while more than half of those surveyed (51%) used some kind of open or closed online group to communicate, share information or participate in a local support network. [2.1.1,2]

2.1.2 Social Environment. Growing generation

Generation Z are the people who were born from 1995 to 2010. Generation Z is going to represent 82 million people by 2026. In other words, the largest generation. [2.1.2,1]

At work, they are considered "ultra-focused" [2.1.2,2], which differs from the perception of older generations that may have about them. They were stereotyped astech-addicted warriors of social justice.

Generation Z takes care about making the difference in contrast to earlier generations, which ripen in social causes, Gen Z is socially concentrated. They are passionate, similar to the Millenials, about the problems of social justice. Unlike Gen Y and even some of generation X, Gen Z also takes care of full equality.

One of the basic values of the Best Gen Z is that they care about other groups and formal volunteers. They believe more about actions than words, and since they are "always on", they constantly share the experience.

They care about the planet, but also its people. As a group that takes care of the community (local and global), they also appreciate genuine brands and non-commercial products. Members of Generation Z are passionate about social change.

About 70% of Gen Z believe that the Government must be more active in solving problems, the PEW Research Center reports [2.1.2,3]. Accordingly, from about 52 to 55% of young voters cast their ballot in the presidential election of 2020 - the level of participation that helped form the final results. [2.1.2.4]

Gen Zers are also good at driving changes. Using platforms such as Snapchat, Instagram, Twitter, and Tiktok, these youth helped move activism into the digital age. Along the way, they've taught the rest of the world how to use social media to bring attention to a particular cause or problem that they want to improve.

Some examples today: Members of the Z generation organized marches across the country after a militant killed 17 people at Marjory Stoneman Douglas in high school in Parkland, Florida. Swedish teenager and Environmental activist Greta Thunberg engaged in social media to enchant the world and challenge leaders to take measures against climate change.

In America, 62% of young people believe that their voices are more powerful online than offline, according to the research firm YPulse [2.1.2,5] and 97% of Gen Z, using at least one mainstream social media platform [2.1.2,6]

2.1.3 Political and Social Environment. Growing misinformation and declining trust

At every election in all countries, politicians stretch the facts and avoid journalistic investigations. Spreading disinformation is popular among political parties, and social media open up many new horizons for such activities. The problem of disinformation and manipulation is actively discussed after the 2016 US elections and the scandal with the Trump campaign, Facebook and Cambridge Analytics. All of this undermines people's confidence in the media in general.

The media has included fact-checking in their coverage of events and studied politicians whenever possible, but fewer and fewer people are watching these interviews and debates. Increasingly, politicians are trying to bypass the media and convey messages directly through social media. Facebook is seen as the main channel for spreading false information almost everywhere, but WhatsApp is considered more responsible in parts of the Global South, such as Brazil and Malaysia.

Even before the coronavirus crisis hit, more than half of the global sample said they were concerned about what is true or false on the Internet when it comes to news. As the media adapts to changing styles of political communication, most people (52%) would prefer that they report false statements by politicians in a prominent place rather than highlight them (29%). People are less comfortable with political ads via search engines and social media than political ads on TV, and most people (58%) would prefer platforms to block ads that may contain inaccurate statements - even if that means they ultimately have to make a decision on what is true. [2.1.3,1]

2.1.4 Technological Environment. Development of semantic search based on AI

Artificial intelligence machine learning becomes more useful and fast developing. And it is better to start using these technologies now, not only to facilitate the work with data and simplify research, but in order to feel more confident in this rapidly developing world.

Semantic search engines can bring advantage to many industries - from Biotech and Pharmaceuticals to e-commerce. Some companies use semantic search engines to improve the performance of the team at the Research and Development Stage. While others implement advanced search technology for their customers, especially if the online company has a huge database of products it sells.

Although this technology is fresh, you can still build next to the ideal system of semantic search engine AI even for the most complex data domains. And since the technologies are moving at a rapid pace, we can expect such engines to quickly progress.

Semantic search tools based on artificial intelligence algorithms (AI) helps to detect the relevant data and improve access to ever-growing information available online or in internal repositories.

2.1.5 Macroeconomic environment

As far as we plan to create a product for the UK and US markets, we are going to analyze macroeconomics indicators for these countries. However, the main Research and development center will be in Ukraine, so data on the Ukrainian macroeconomic situation is also important.

Indicator Name	Country Name	2010	2011	2012	2013	2014
GDP per capita (USD th)	UK	39.44	42.04	42.46	43.44	47.43
GDP per capita (USD th)	Ukraine	2.97	3.57	3.86	4.03	3.10
GDP per capita (USD th)	United States	48.47	49.89	51.61	53.12	55.06
Unemployment, total (% of total labor force)	UK	7.79	8.04	7.88	7.52	6.11
Unemployment, total (% of total labor force)	Ukraine	8.10	7.85	7.53	7.17	9.27
Unemployment, total (% of total labor force)	United States	9.63	8.95	8.07	7.37	6.17
Final consumption expenditure (% of GDP)	UK	85.91	85.25	85.33	84.98	84.28
Final consumption expenditure (% of GDP)	Ukraine	83.16	84.17	86.94	90.75	90.11
Final consumption expenditure (% of GDP)	United States	84.68	84.62	83.49	82.51	82.09
Inflation, consumer prices (annual %)	UK	2.49	3.86	2.57	2.29	1.45
Inflation, consumer prices (annual %)	Ukraine	9.37	7.96	0.57	(0.24)	12.07
Inflation, consumer prices (annual %)	United States	1.64	3.16	2.07	1.46	1.62
Gross savings (% of GDP)	UK	13.17	13.92	12.38	11.44	12.45
Gross savings (% of GDP)	Ukraine	17.55	15.77	13.07	8.77	9.90
Gross savings (% of GDP)	United States	15.55	16.57	18.88	19.31	20.46

Table 2.1. Macroeconomic indicators UK, Ukraine, US (2010-2014) [2.1.5,1]

In order to understand macroeconomic factors we considered such indicators as GDP per capita in USD, Unemployment rate, Final consumption expenditure, Inflation rate and Gross savings in percent of GDP.

Indicator Name	Country Name	2015	2016	2017	2018	2019
GDP per capita (USD th)	UK	44.97	41.06	40.36	43.04	42.33
GDP per capita (USD th)	Ukraine	2.12	2.19	2.64	3.10	3.66
GDP per capita (USD th)	United States	56.84	57.95	60.06	63.00	65.30
Unemployment, total (% of total labor force)	UK	5.30	4.81	4.33	4.00	3.74
Unemployment, total (% of total labor force)	Ukraine	9.14	9.35	9.50	8.80	8.19
Unemployment, total (% of total labor force)	United States	5.28	4.87	4.36	3.90	3.67
Final consumption expenditure (% of GDP)	UK	83.97	84.22	83.68	83.95	83.65
Final consumption expenditure (% of GDP)	Ukraine	86.68	85.20	87.74	90.13	95.23
Final consumption expenditure (% of GDP)	United States	81.79	82.45	82.40	82.04	81.83
Inflation, consumer prices (annual %)	UK	0.37	1.01	2.56	2.29	1.74
Inflation, consumer prices (annual %)	Ukraine	48.70	13.91	14.44	10.95	7.89
Inflation, consumer prices (annual %)	United States	0.12	1.26	2.13	2.44	1.81
Gross savings (% of GDP)	UK	12.63	12.12	13.86	13.44	13.33
Gross savings (% of GDP)	Ukraine	17.69	20.28	17.79	15.21	12.06
Gross savings (% of GDP)	United States	20.29	18.72	18.64	18.62	18.71

Table 2.2. Macroeconomic indicators UK, Ukraine, US (2015-2019) [2.1.5,1]

In recent years unemployment rates for the UK and USA were lower than 4% while Unemployment in Ukraine was above 8%, though it was continually decreasing. Unemployment rate in Ukraine will make the hiring process as Research and Development lab is planned to be in Ukraine so we can expect accessible labor cost. Gross savings in the United States is above 18% which is also a good high of the purchasing power of people.

Indicator Name	Country Name	2018	2019	CAGR 15-19	CAGR 10-19
GDP per capita (USD th)	UK	43.04	42.33	-1.20%	0.79%
GDP per capita (USD th)	Ukraine	3.10	3.66	11.48%	2.36%
GDP per capita (USD th)	United States	63.00	65.30	2.81%	3.37%
Unemployment, total (% of total labor force)	UK	4.00	3.74	-6.73%	-7.83%
Unemployment, total (% of total labor force)	Ukraine	8.80	8.19	-2.17%	0.12%
Unemployment, total (% of total labor force)	United States	3.90	3.67	-7.02%	-10.16%
Final consumption expenditure (% of GDP)	UK	83.95	83.65	-0.08%	-0.30%
Final consumption expenditure (% of GDP)	Ukraine	90.13	95.23	1.90%	1.52%
Final consumption expenditure (% of GDP)	United States	82.04	81.83	0.01%	-0.38%
Inflation, consumer prices (annual %)	UK	2.29	1.74	36.41%	-3.93%
Inflation, consumer prices (annual %)	Ukraine	10.95	7.89	-30.52%	-1.90%
Inflation, consumer prices (annual %)	United States	2.44	1.81	72.51%	1.12%
Gross savings (% of GDP)	UK	13.44	13.33	1.08%	0.14%
Gross savings (% of GDP)	Ukraine	15.21	12.06	-7.38%	-4.08%
Gross savings (% of GDP)	United States	18.62	18.71	-1.61%	2.07%

Table 2.3. Macroeconomic indicators UK, Ukraine, US CAGR(15-19) and CAGR(10-19) [2.1.5,1]

GDP per capita in the USA had 3.37% CAGR which shows a stable and growing economical situation. As well GDP per capita in the UK. The other one positive economical environment for USA and UK is decreasing unemployment rate with CAGR -6.73% for UK and -7.02% for USA for 2015-2019 years. Inflation in the US and UK stay below 2% while inflation in Ukraine is about 9% and rapidly changing through years which indicate relative instability in the economy but typical for developing countries like Ukraine.

2.1.6 Legal Environment. Australia's News Media Bargaining Code

In December, the Australian government passed the "world's first" law that would force tech giants to pay local news outlets to post and link to their articles. Google objected, warning that the proposed code for negotiating with the media "would violate the fundamental principle of the web," and threatened to remove its search engine from Australia.

"The ability to link freely between sites is a fundamental part of the Internet. Just like you don't pay to place a hyperlink in an email, websites and search engines don't pay to provide links to third-party websites. This sets a disruptive precedent and gives one group of content, news publishers, an edge over everyone else, which breaks Google search." [2.1.6,1]

Google created a proposal to amend the law supporting journalism without disrupting Google search. They suggested paying publishers through the Google news showcase, not for links and snippets in search. News Showcase is a licensing program in which they will invest 1 billion USD worldwide over the next three years to help news companies publish and promote their articles online. Publishers will be paid for their journalist's editorial expertise and access to their journalism outside of paid access. Already, about 450 publications in a dozen countries of the world have subscribed, including six publishers in Australia. [2.1.6,2]

Google News Showcase will operate under this new law with binding arbitration in News Showcase as support for resolving any disputes. While the reward will be made through the newsroom, other minimum Code requirements may still apply to Google searches.

Google also proposed reasonable amendments to the arbitration model that would bring it in line with generally accepted models and lead to fair commercial results, as well as algorithm notification requirements that are applicable to Google and useful to news publishers. [2.1.6.3]

Unlike Google, Facebook moved away from the negotiating table and began to prevent people from sharing news links from Australian publishers around the world. [2.1.6.4]

"While the government has made some changes, the proposed law fundamentally fails to understand how our services work. Unfortunately, this means that people and news organizations in Australia are now prohibited from posting news links and sharing or viewing Australian and international news content on Facebook. "

The negotiation process continues, and so far it is only for Australia. But this is for now and when other countries do something similar, it is only a matter of time.

Fact-checking companies are primarily nonprofit, and they do not fall under this law, as well as us while we are a startup. However, we definitely need to support good relations with fact-checking companies and consider some financial compensations or other win-win deals. [2.1.6,5]

2.2 Micro analysis

The interesting and related markets to this project are Digital News Market, Social networks market, and Software (Entertainment) market. I will pay attention to the development of the social network markets, as this is where our target audience is. As the main source of revenue for Social Networks is advertisement we will also pay attention to their revenues and margins. Also, I will consider not only financial metrics but daily active users to understand the market size.

To understand digital news market development, I got an example of one of the most popular digital newspapers and their income from a digital subscriber. For the Software (Entertainment) market, I took data from Damodaran sector analysis to understand growth potential and market health; more financial data and benchmarks on Industry benchmarks.

Indicator	Units	2015	2016	2017	2018	2019	2020	CAGR
Number of paid subscribers (digital only news product)	Units th	1,094	1,608	2,231	2,713	3,429	5,090	36.00%
Revenue	USD mln	1,579	1,555	1,675	1,748	1,812	1,783	2.46%
Operating Income	USD mln	136	112	176	190	175	176	5.29%
Net Income	USD mln	63	29	4	125	134	100	9.68%

Table 2.4. Financial indicators New York Times (2015-2020) [2.2,1] [2.2,2]

Number of paid subscribers to digital only product of one of the most popular newspapers New York Times reached more than 5 million subscribers. Compound annual growth rate for the period from 2015 to 2020 is incredibly high 36%. This indicates the popularity of digital news and interest of people to such types of products. New York Times stays a profitable company with total income 100 mln USD in 2020 and operating margin 10.1%

Indicator	Units	2015	2016	2017	2018	2019	2020	CAGR
Monetizable Daily Active Usage (mDAU) United States	mln		24	25	27	31	37	11.43%
Monetizable Daily Active Usage (mDAU) International	mln		79	89	99	121	155	18.35%
Revenue	USD mln	2,218	2,529	2,443	3,042	3,459	3,716	10.87%
Operating Income	USD mln	(450)	(367)	38	453	366	26	
Net Income	USD mln	(521)	(456)	(108)	1,205	1,465	(1,135)	

Table 2.5. Financial indicators Twitter (2015-2020) [2.2,3] [2.2,4]

Twitter is one of the most famous social media platforms. Monetized Daily Active Use (mDAU) in the US alone reached 37 million users in 2020, with a compound annual growth rate of 11.43% from 2016 to 2020. Twitter is growing steadily, with an even increasing rate of growth. Twitter's main source of income is advertising and we can see that their revenue hit $ 3.7 billion in 2020 and continue to grow.

Indicator	Units	2015	2016	2017	2018	2019	2020	CAGR
Number of daily active users worldwide	mln	1,038	1,227	1,401	1,523	1,657	1,845	12.19%
Number of daily active users US&Canada	mln		180	184	186	190	195	2.02%
Number of daily active users worldwide Europe	mln		262	282	282	294	308	4.13%
Revenue	USD mln	17,928	27,638	40,653	55,838	70,697	85,965	36.82%
Operating Income	USD mln	6,225	12,427	20,203	24,913	23,986	32,671	39.32%
Net Income	USD mln	3,688	10,217	15,934	22,112	18,485	29,146	51.20%

Table 2.6. Financial indicators Facebook (2015-2020) [2.2,5]

We will also look at the financial performance of Facebook as the largest social network in the world. The number of daily active users in the US and Canada alone reached 195 million users in 2020, with a compound annual growth rate of 2.02% from 2016 to 2020. While growth rates in the US and Canada are declining as the market becomes saturated, the number of daily

active users worldwide continues to grow rapidly. Facebook's revenue in 2020 was nearly 86 billion USD with an operating margin of 38% and a net profit margin of 34%.

Software (Entertainment)	
Number of Firms	101
CAGR in Net Income- Last 5 years	9.33%
CAGR in Revenues- Last 5 years	-0.41%
Expected Growth in Revenues - Next 2 years	23.95%
Expected Growth in EPS - Next 5 years	19.72%
Publishing & Newspapers	
Number of Firms	29
CAGR in Net Income- Last 5 years	18.73%
CAGR in Revenues- Last 5 years	0.31%
Expected Growth in Revenues - Next 2 years	-3.01%
Expected Growth in EPS - Next 5 years	9.21%

Table 2.7. Historical (compounded annual) growth rate in net income and revenues - last 5 years US companies 2020 [2.2,6]

In order to understand benchmarks for the industry, we also looked at the data Software (Entertainment) industry and Publishing & Newspapers industry from Aswath Damodaran, Professor of Finance at the Stern School of Business at New York University. The net income compound annual growth rate in the last 5 years for the Software(Entertainment) industry is 9.33%. Compound annual growth rate in last 5 years for the Publishing & Newspapers industry is twice higher than for Software(Entertainment) 18.73%.

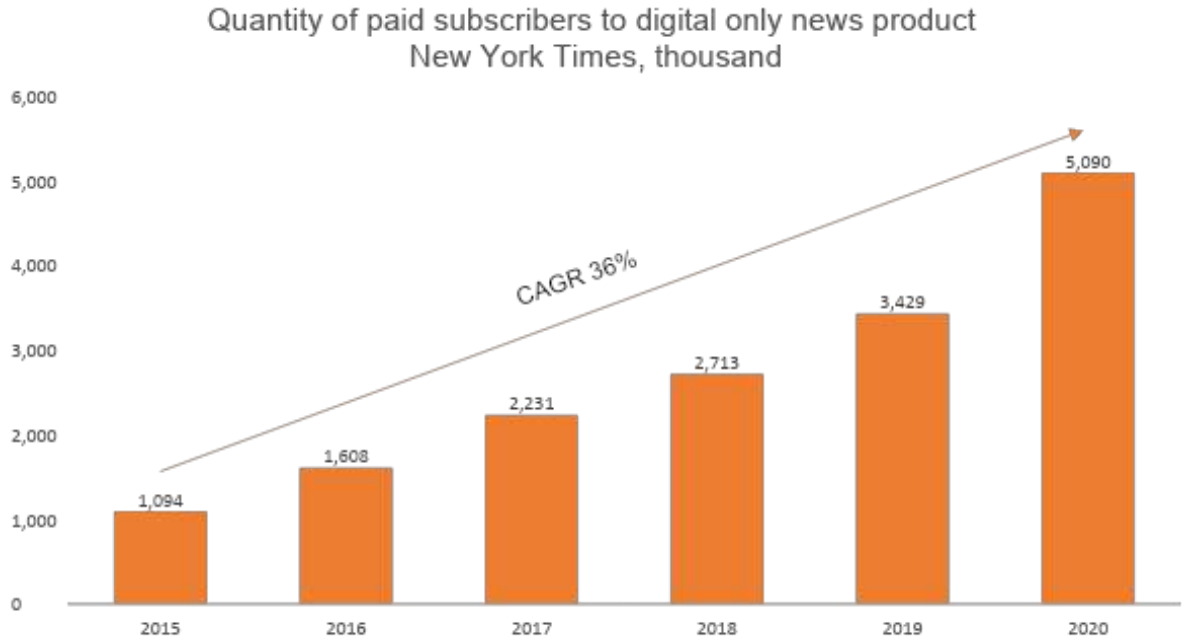

Figure 2.1. Quantity of paid subscribers to digital only news product New York Times, thousand [2.2,7]

- Digital news market in the UK is drastically increasing
- At the end of 2020 the quantity of paid subscribers reached more than 5 mln
- The digital news market shows a strong positive trend

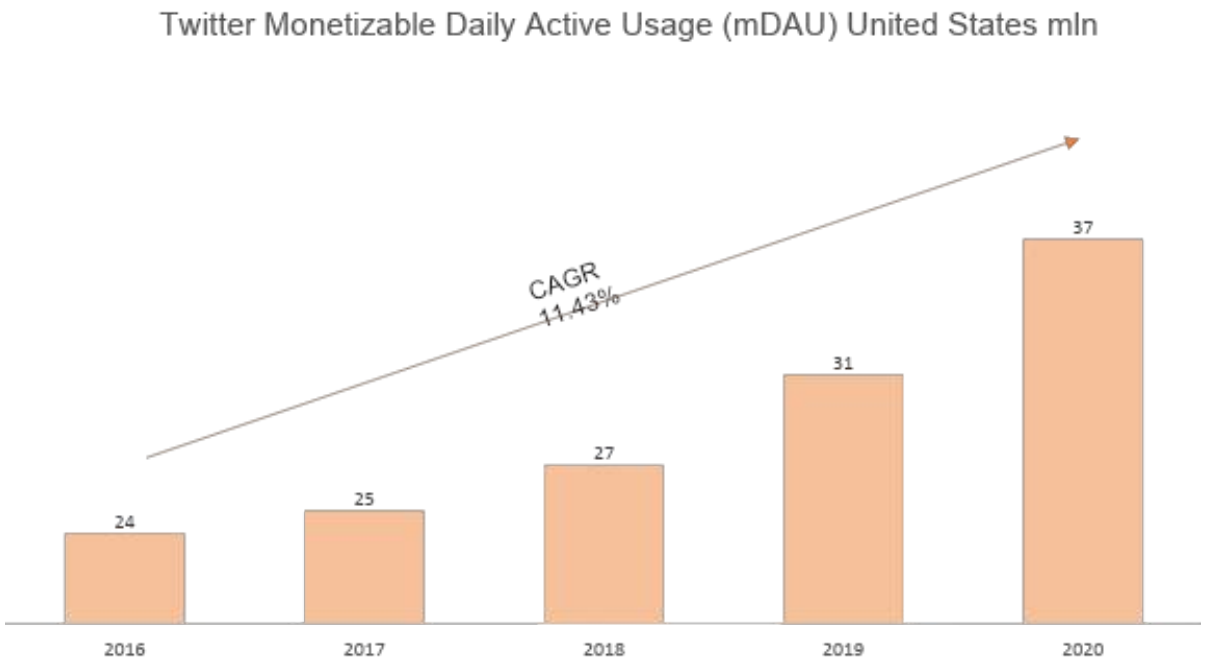

Figure 2.2. Twitter Monetizable Daily Active Usage (mDAU) United States, mln [2.2,8]

- Using of social networks continues to increase
- By the end of 2020 quantity of Twitter Monetizable, Daily Active Usage in the US reached more than 37 mln.
- Twitter has the potential to increase the growth rate

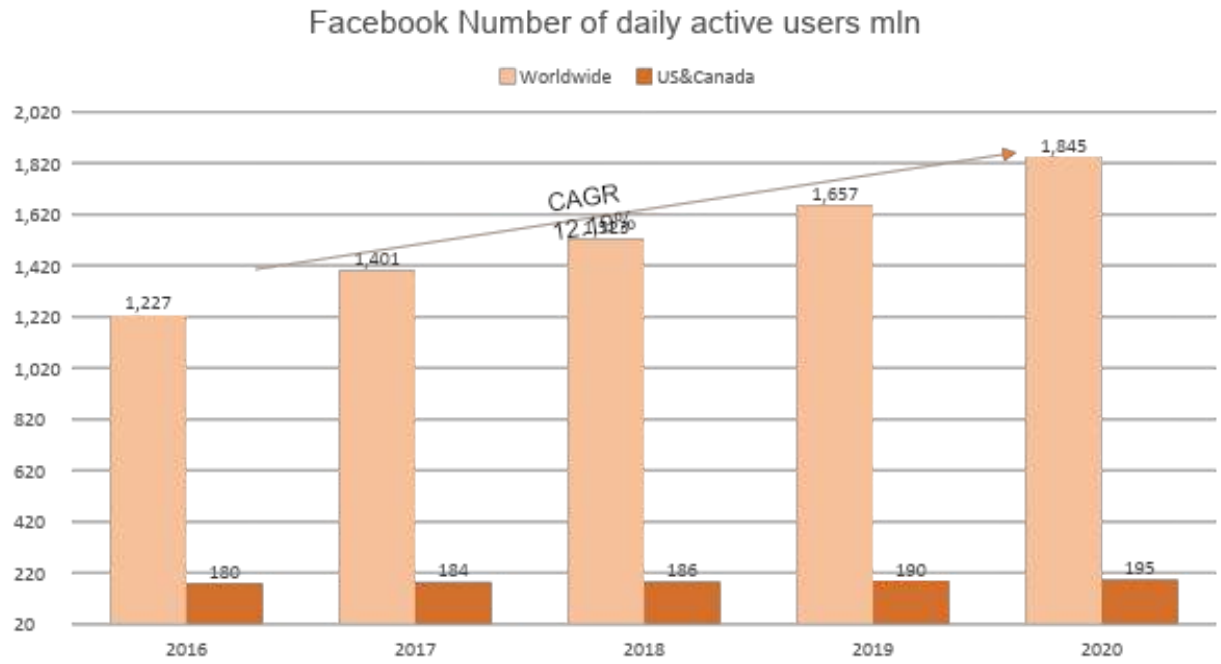

Figure 2.3. Facebook Number of daily active users Worldwide and US and Canada comparison, mln [2.2,9]

- USA & Canada users account for 10 percent of all users.
- The Us&Canada quantity of daily users continues increasing but at a much slower rate than the overall worldwide increase.
- Overall US and Canada Facebook quantity of daily users reached more than 195mln by the end of 2020

Indicator	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**CAGR**
Digital ad spending USD bill	283.35	333.25	384.96	435.83	479.2	517.51	12.80%
% change	21.40%	17.61%	15.52%	13.21%	9.95%	7.99%	-17.87%
% of total media ad spending	45.90%	50.10%	53.60%	56.60%	58.80%	60.50%	5.68%

Table 2.8 Digital Ad Spending Worldwide (2018 - 2023) [2.2,10]

Since our main income will be in-product advertising, we also looked at data on advertising spending worldwide. Digital ad spending reached 384.96 billion USD in 2020 and is projected at 517.51 billion USD in 2023, with a CAGR of 12.8%. Although the growth rate of digital advertising spending is gradually slowing down, it is steadily increasing its share of total media spending.

2.3 Competitive landscape analysis

In order to analyze the level of competition, we will use Porter's Five Forces analysis framework. According to this concept, competitiveness does not come only from competitors. Instead, the state of competition in an industry depends on five basic forces: the threat of substitute products or services, the threat of new entrants, bargaining power of suppliers, bargaining power of buyers, and existing industry rivalry.

2.3.1 Bargaining power of suppliers

For the UK and USA this is relatively low as for now. We can use links and materials based on fair use showing just links and small descriptions. The user would click on the link and follow to the source, and that is completely ok to do it the same way as searching systems such as Google do it.

However, now there is a trend to change. Australia's News Media Bargaining Code arose and became a world precedent that discusses exactly this issue. There is still a negotiation process, though Google already made a deal (with arguable specific conditions) while Facebook is still fighting against this law.

The negotiation process proceeds, and for now, that only for Australia. But that for now and when other countries will do something like this is just a matter of time.

Fact-checking companies are primarily nonprofit, and they do not fall under this law, as well as us while we startup. However, we definitely need to support good relations with fact-checking companies and consider some financial compensations or other win-win deals.

This is good since that will stimulate fact-checking organisations and help them develop and spread their content, which is one of our main goals and vision. Also, as content will become more quality, that will attract new users. However, that should be done in the right way, so it does not threaten our financial goals.

2.3.2 Threat of new entrants

The first is the economy of scale. It refers to the caste advantage that a company on the market due to their large size. The benefit comes from the inverse relationship between the fixed unit cost and the quantity produced: the larger the amount of output produced, the lower the fixed unit cost. As we have a single system with our daily users' growth, our profit will arise while developing costs will stay the same. As far as our variable cost is as low as the price of computational power for the server (which is relatively miserable), we will get a higher income with each new user.

Also, a larger quantity of users increases loyalty to the brand, and trust in the product is critical in the fact-checking industry. Suppliers (Fact-checking organizations) will be much more interested in collaboration with a product with a higher user base as it opens their content to wider auditory. That means economy of scale is an important barrier for entrance.

The other barrier is the complexity of business and industry by itself and the relatively high cost for research and development. That is an emerging market with no defined processes and rules. To understand it fully, you need to deep dive into the industry. In order to have a working product a relatively high level of investment is needed (compared to similar products in the software industry) for research and development because many components have to be developed simultaneously to have an MVP product: AI searching system, application, and interface, data processing, and collection system, etc.

Loyalty for existing brands is the other important barrier. Trust in the brand is highly important as one of the most principal factors for clients. In order to work as the provider of fact-checking information, you need to earn a good and clean reputation among your users, and this is cost time.

2.3.3 Bargaining power of buyers

The bargaining power of buyers can be assessed as relatively high. We highly depend on the perception of our product by customers and their trust. Since this is not an essential and vital product, our relations with the customers are fundamental. Though our product is free, it is important to track customers' loyalty to the advertisement and the amount of it.

2.3.4 Threat of substitute products

One of the possible substitutes for our product is a paid subscription to a quality news service that checks their news attentively in most cases, and users do not have to check them additionally. However, that closes only part of the need and is relatively quite expensive.

The other substitute is big corporation fact-checking systems such as Google and Facebook that they also use internally for their products. However, they are hard to be used while reading the news and have an arguable reputation, so people tend not to believe them in questions related to fact-checking and truth defending.

2.3.5 Rivalry among existing competitors

As this emerging market, competition in the market is relatively low and there is currently more effort at market creation and product development rather than aggressive marketing, user acquisition, and competition. There are applications that work in this area such as GlenKessler, FactStream and Logically.

Glenn Kessler's app is the home of the Washington Post fact-checking on iPhone and iPad. They concentrate on fact-checking and have a good rating (4.6) in the App Store (700 ratings)

FactStream is an application that provides real-time fact checking during political events. FactStream, currently available for iPhone and iPad, provides users with pop-ups that include previously published fact checks or real-time analysis of factual statements by politicians. FactStream was developed as a part of the Tech & Check Cooperative Project, a reporters' lab at Duke University, which uses automation to help fact-checkers do their jobs and grow audiences for this important journalism. Free on the App Store. 4.5 rating 2921 ratings.

Logically - Logically App claims to give you verified and unbiased news you can trust, plus a fact-checking service made up of the world's largest fact-checking team, powered by sophisticated artificial intelligence technology. App Store score of 3.2, claimed to be biased.

Logically is a UK tech startup that uses AI to detect misinformation and provides fact-checking services to combat fake news. Logically raised a total of $ 12.7 million in funding over 3 rounds. Their last funding was received on 13 July 2020 from a seed round. Logically financed by 2 investors. NPIF- Mercia Equity Finance and XTX Ventures are the most recent investors. [2.3.5,1]

CHAPTER 3. PRODUCT AND SOLUTION

3.1 Value proposition canvas

To better understand the purpose of the application and what exactly it is supposed to do, we will look at it through the value proposition canvas.

Customer profile

Customer jobs – the functional, social and emotional tasks customers are trying to perform, problems they are trying to solve and needs they wish to satisfy.

- Reads news from different sources using his phone.
- Takes an active civic position.
- User of social networks and messengers.
- Expresses his opinion using social networks.
- Worries about politics and important social issues.

Pains – the negative experiences, emotions and risks that the customer experiences in the process of getting the job done.

- It is difficult and time-consuming to check the sources and the veracity of the information.
- It is not clear where the facts are and where the author's own opinion is.
- Too many loud manipulative but unsubstantiated statements from politicians.
- Too much information complicates its perception.
- Big amount of disinformation.
- Too many sources with unknown reputation.
- Manipulation of public opinion through fakes
- Information overload.
- There is no control of the distribution of fake news through messengers.
- To fully understand political topics, you need to read too much information.

Gains – the benefits which the customer expects and needs, what would delight customers and the things which may increase likelihood of adopting a value proposition.

- Ability to quickly check facts in the news that users read every day.

- You do not need to look for confirmation from different sources yourself, the system itself will provide you with all the relevant data on the news.
- You can check news from any source, be it social networks or messengers.
- The user feels more confident in the information he is reading.
- The user can trust the news that he reads and confidently make decisions based on it.
- It's easier to check where the facts are and where the author's own opinion is.
- Understanding which news is fake, it is easier to understand the political and social events that are happening around.

Value Proposition

Gain creators – how the product or service creates customer gains and how it offers added value to the customer.

- The ability to check the facts in just a couple of clicks on the device.
- A system that automatically selects the relevant information for your request.
- The opportunity to delve deeper into the topic and read the entire article on the fact-checking site.
- The ability to check the news from any source.

Pain relievers – a description of exactly how the product or service alleviates customer pains.

- Using only trusted sources and information.
- Display only relevant information based on the user's request.
- User notifications as soon as relevant fact-checking studies are released.

Products and services – the products and services which create gain and relieve pain, and which underpin the creation of value for the customer.

- Mobile application for IOS.
- Design that oriented on user request and quick fact-checking.
- Semantic search system for the selection of relevant news from fact-checking organizations.
- System for collecting, processing, and storing information from fact-checking organizations.
- A notification system that will inform you about the relevant information from fact-checking organizations.

3.2 Business model Lean Canvas

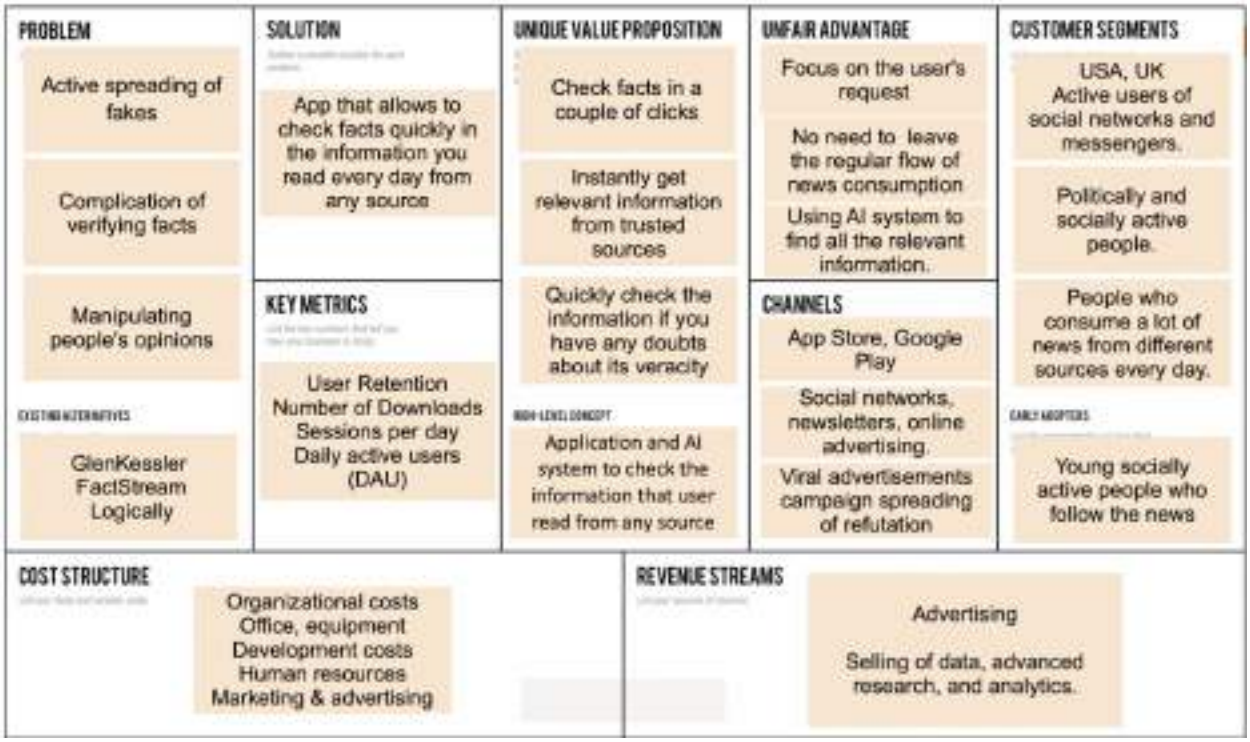

Figure 3.1. Lean Canvas

The focus of the application is on acquiring active users and building up the user base. We plan one of the main advertisement mechanisms to spread our brand through social networks by users organically through reposting.

As the user base is our main target, the application by itself will be freely distributed.The main source of income is contextual native advertising. There are also possible additional sources of income such as selling news and media research, data, and analytics for researchers and journalists.

The application focuses on the USA and UK markets with a focus on young socially active Internet users. Marketing strategy is based on the trend of social justice and the expression of position and social responsibility through social media.

3.3 Use Case Diagram

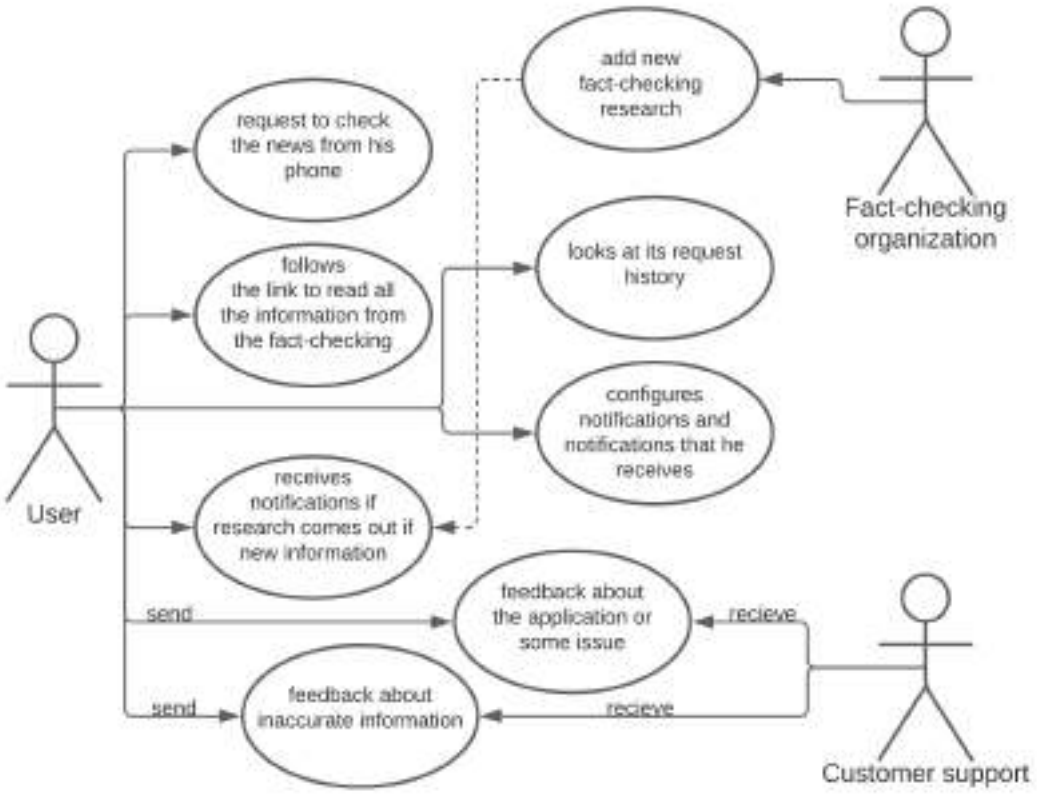

Figure 3.2. Use Case Diagram

3.4 Process diagram

We will describe the process flow of two fundamental scenarios in the application: "User request to check news", and "Processing of new information from fact-checking organization".

Main components of the application are:

- Mobile application UI
- AI semantic search and data processing system
- System for collecting data from fact-checking organizations
- System for processing and storing data
- A notification system

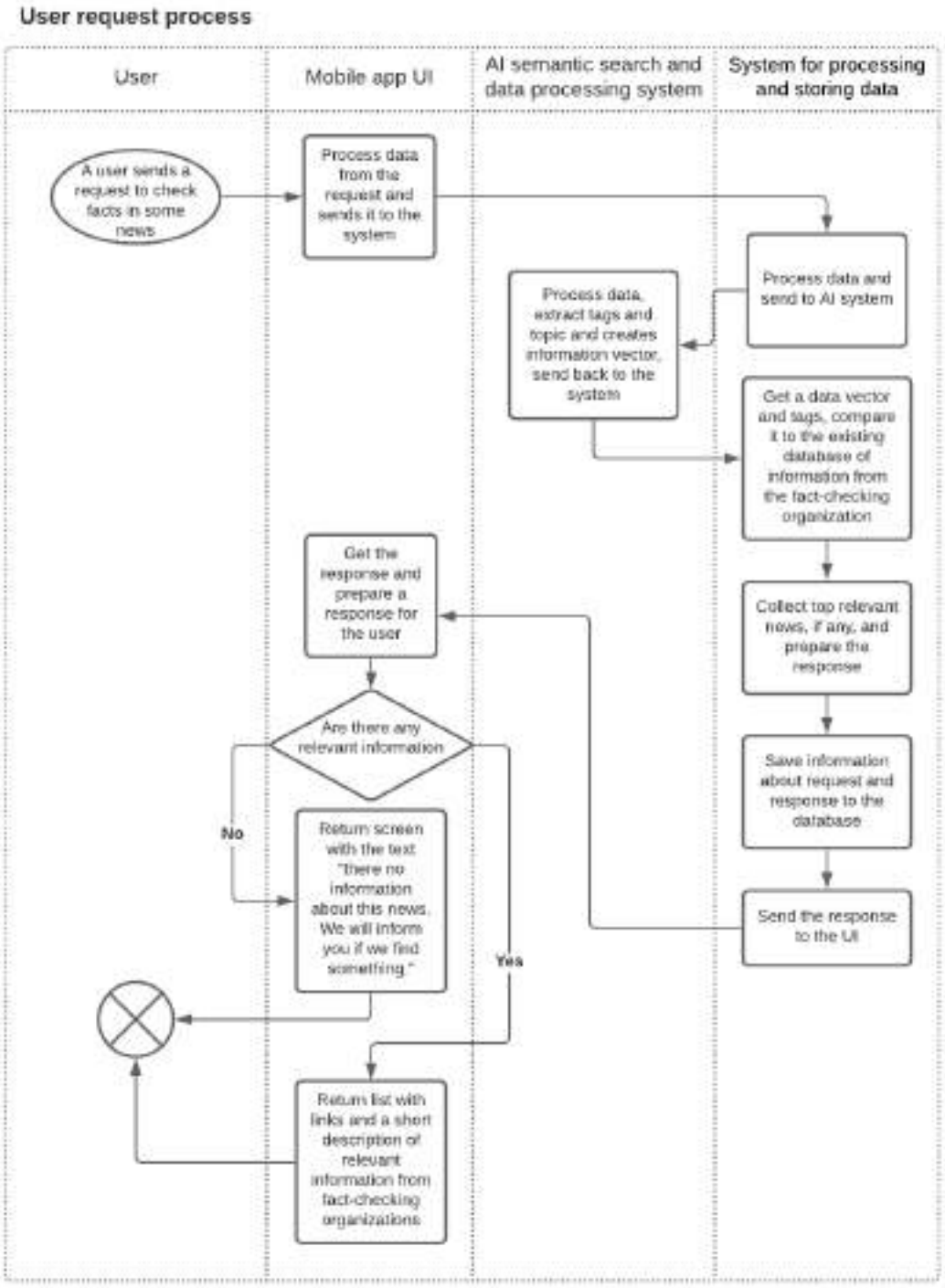

Figure 3.3. Process flow diagram “User request to check news”

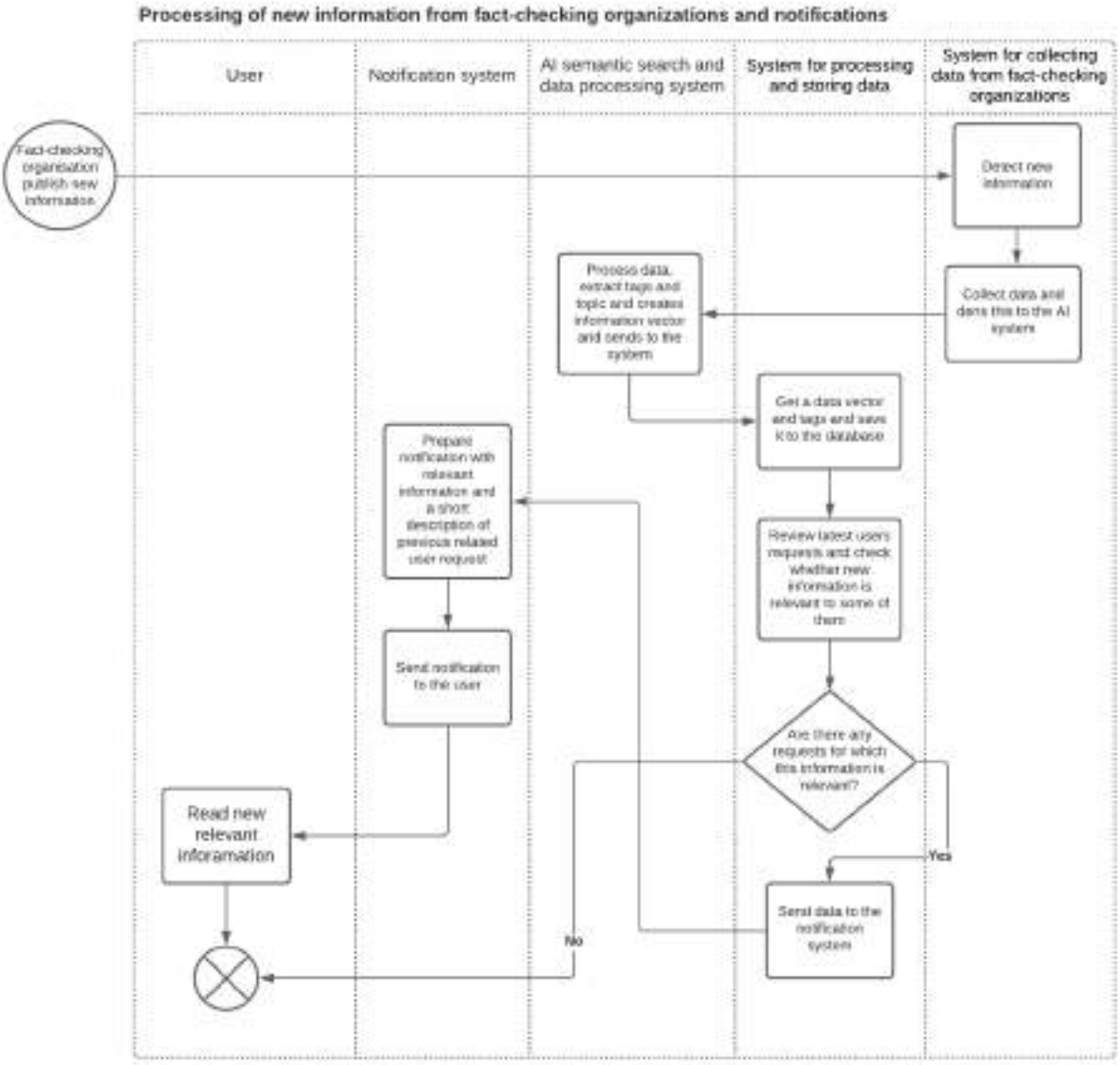

Figure 3.4. Process flow diagram "Processing of new information from fact-checking organization"

3.5 Entity Relationship Diagram (ERD)

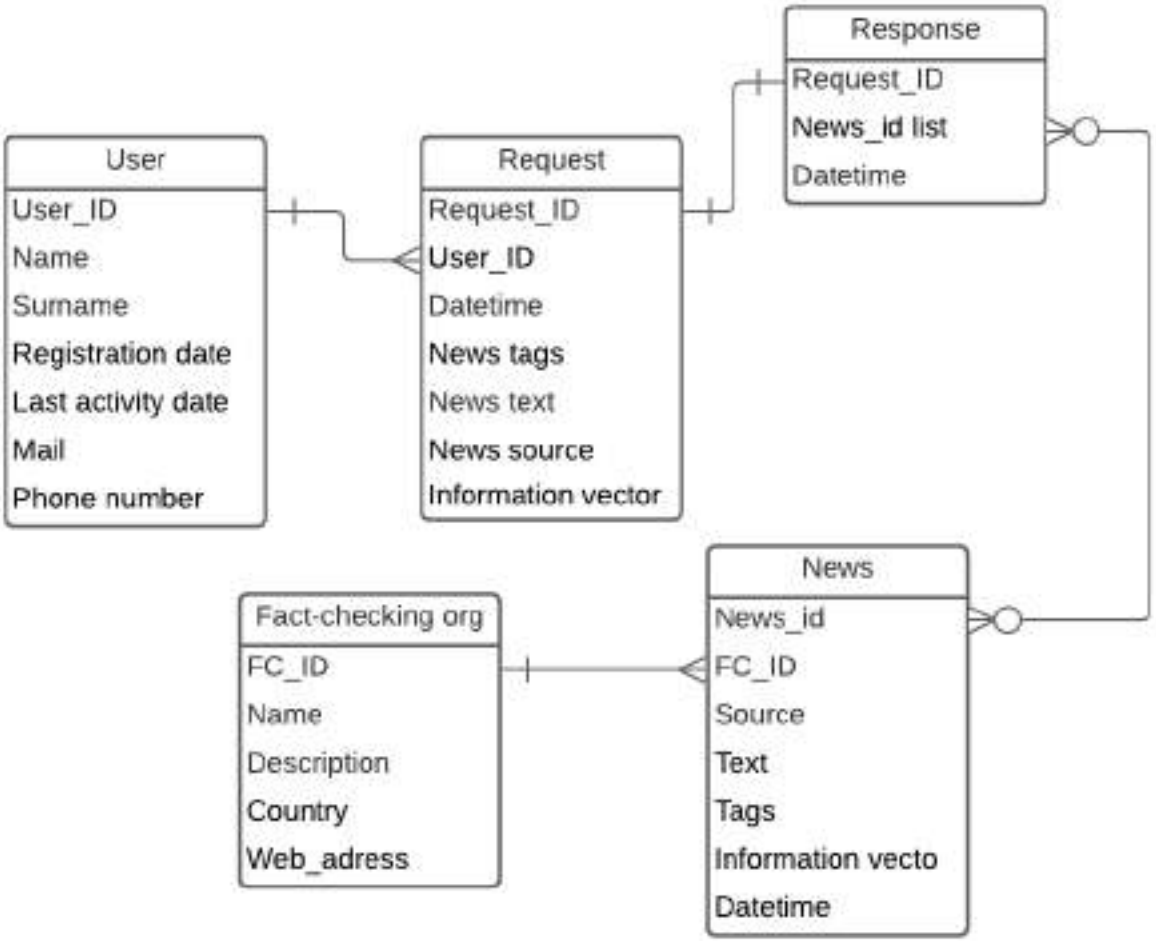

Figure 3.5. Entity Relationship Diagram (ERD)

3.6 Functional requirements

3.6.1 Functional requirements

1. As a User, I want to check the facts in the news that I read just in a few clicks so that I can be sure about the information that I read.

   Acceptance criterias:

   1.1. User can click share button and sand the news he is reading to the app
   1.2. User will be forwarded to the app
   1.3. Loading screen is shown
   1.4. If there some relative news from fact checking organizations user user can see the list of this articles with short descriptions and link to the source
   1.5. If there is no relevant information from fact-checking organizations, users see the screen with text: “There is no information about this news yet. We will let you know if we find some”

2. As a User, I want to follow the link to the site of a fact-checking organization so that I can read the full article.

   Acceptance criterias:

   2.1. User can click any link from the list of news articles
   2.2. After user click the link he is forwarded to the full article on the original source

3. As a User, I want to get a notification if some new information arises that is relevant to my previous requests so that I can be sure I didn't miss anything.

   Acceptance criterias:

   3.1. After some new relevant information is arise user get a notification to his phone about it
   3.2. Notification consist of short description of the news, source of this news and short description of user request that is related to this
   3.3. User can click a notification and see full description
   3.4. User can follow the link and view full article on the original source

4. As a User, I want to see a history of my previous requests so that I can review previous responses again.

   Acceptance criterias:

   4.1. There is history button on main menu
   4.2. In history screen user can see all his previous request that he have sent
   4.3. User can click on any of this request and review the response that he received

5. As a User, I want to manage my notification setting so that I can receive only notifications that I want.

   Acceptance criterias:

   5.1. There is “Push notification settings” section in setting screen
   5.2. Toggle option “Notification about new information detected”
   5.3. Toggle option “Notification about fakes detected”
   5.4. Toggle option “Notification about product update ”

6. As a User, I want to be able to leave my feedback about the app or some issue so that the app can fix this.

7. As a User, I want to be able to send feedback about inaccurate data if I find some so that the app can pay attention to that and make an additional investigation.

3.6.2 Non-functional Requirements

- Speed of preparing response to the user should be not longer than 5 seconds
- Size of application should be lower than 200mb
- System should be scalable and able to scale up to 10000 requests per second
- Application and system should be accessible and reliable 99.9% of the time
- A system should be capable enough to handle 2 million users without affecting its performance

3.7 Prototyping

This is a schematic prototype of the main user interface, through this prototype we can see basic user journey ideas.

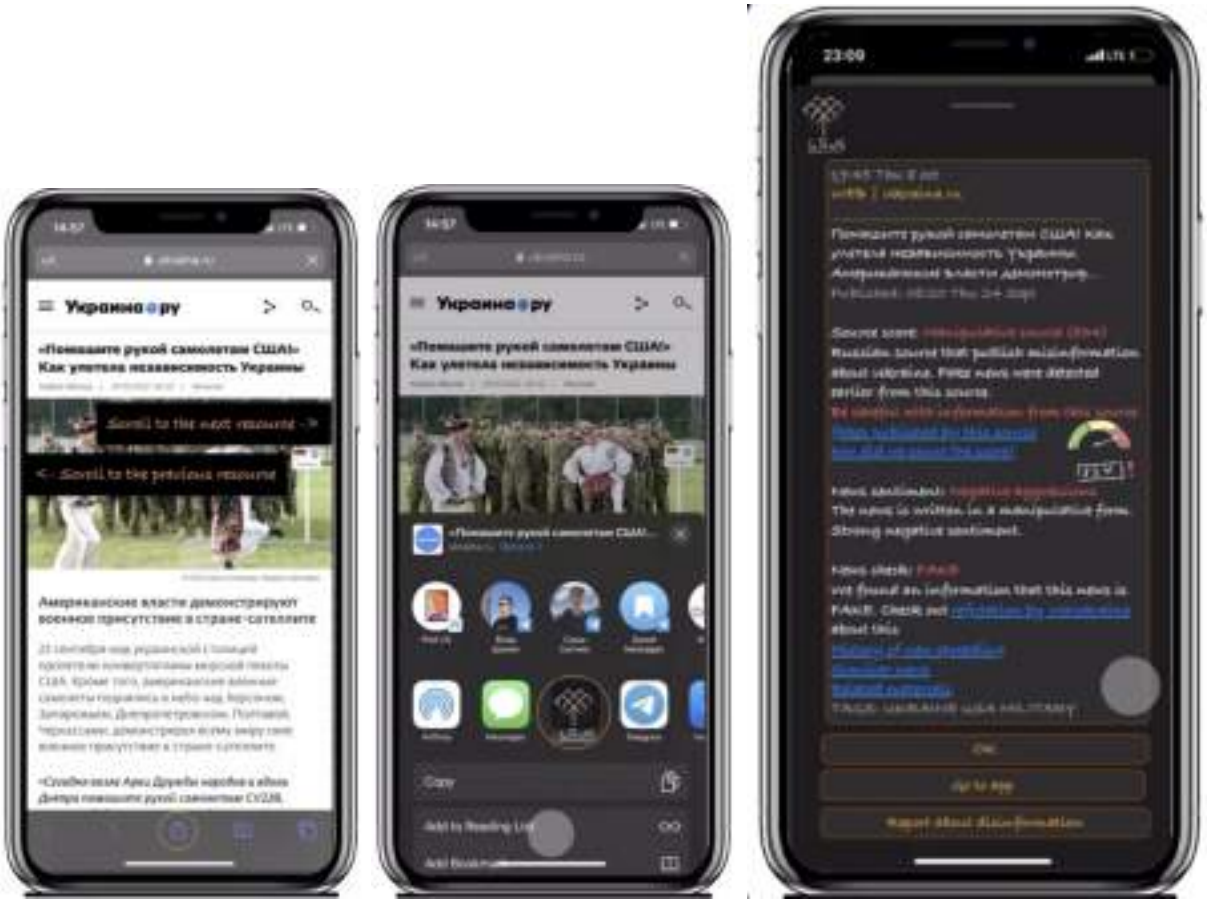

Figure 3.6. Prototype, example of scenario user check news from web source

User journey starts at one point when the user is reading some news, and now he wants to check facts there. The user can click the share button like on the design above and after this the user sees the selection tab shown in the following picture.

Use chooses our App, and after this, the news will be sent to the application as a request and processed by the application. The user will be redirected to the application screen with the information about the news.

The user can follow links and read full articles from fact-checking organizations or continue his reading. The same user flow also works for other sources. Below are examples for Facebook and Telegram (Fig. 3.7. and Fig. 3.8. correspondingly)

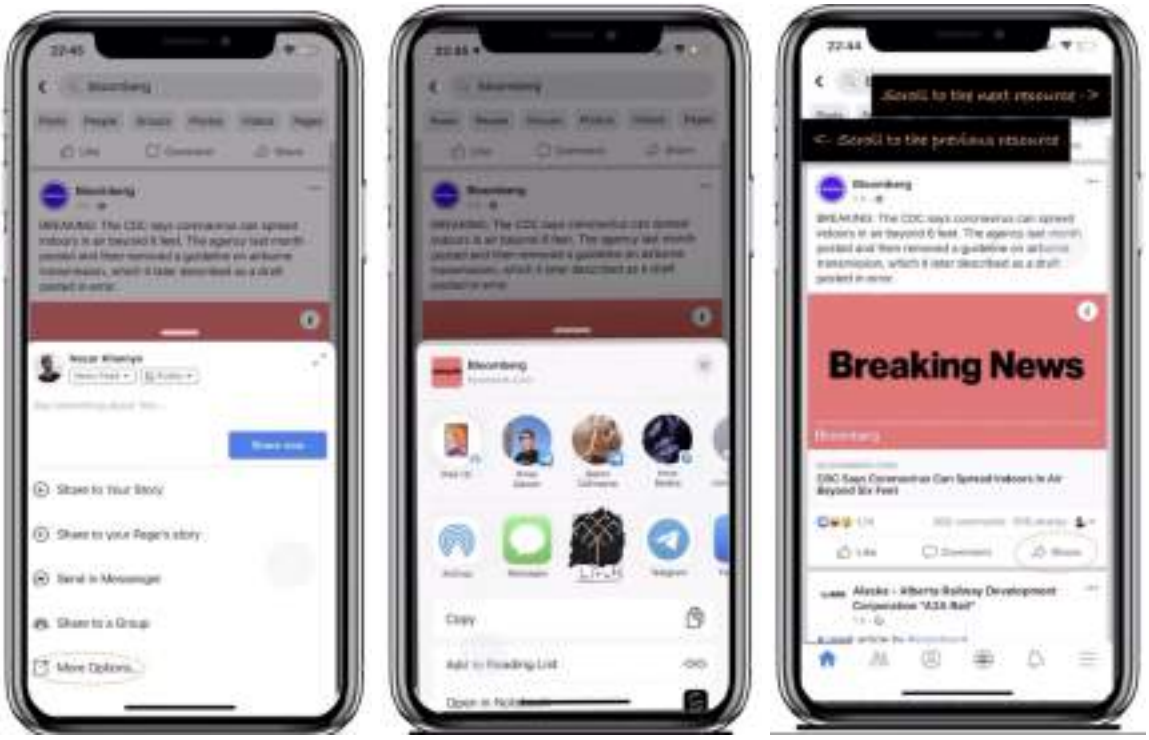

Figure 3.7. Prototype, example of scenario user check news from Facebook

Figure 3.8. Prototype, example of scenario user check news from Telegram

Also, below, you can see main user screens as “history of requests”, “Settings”, ”Notifications” correspondingly.

Figure 3.9. Prototype, screens “History of requests”, “Settings”, ”Notifications”

Full video with responsive prototype and examples of usual user journeys can be found by the QR code below

Figure 3.10. QR code with link to the full video with responsive prototype

3.8 Fact-checking organizations collaboration

How to Identify Fact Checking Organizations?

We will define fact checkers based on The Reporters' Lab database of global fact-checking sites. The database tracks more than 100 non-partisan organizations around the world. The Global Fact-Checking Site Database is a project of the Reporters' Lab at Duke University's DeWitt Wallace Center for Media & Democracy. [3.8,1]

These projects regularly publish articles, videos or audio reports that:

- check the accuracy of the statements of well-known public figures and organizations;
- refute rumors, hoaxes and other forms of disinformation spreading on the Internet;
- or check the status of political promises made by candidates and political parties

The laboratory takes many attributes into account when deciding which organizations to include, for example:

- examines the statements of all parties and sides;
- examines individual claims and reaches conclusions;
- transparently identifies its sources and explains its methods;
- discloses its funding and affiliations.

The Reporters' Lab criteria is similar to the International Fact-Checking Network's Code of Principles. [3.8,2]

With a growing number of collaborative fact-checking projects around the world, Reporters Lab also seeks to identify organizations that individually create their own fact-checking collections. The database is regularly updated throughout the year and includes both active and inactive projects, which are marked and accounted separately.

Top fact-checking organizations in UK:

- Full Fact: This is an independent fact-checking organisation based in the UK which aims to "promote accuracy in public debate", launched in 2009. [3.8,3]
- FactCheckNI: Northern Ireland's first independent, specialized fact-checking service, launched in 2016, verifies claims and offers training in critical thinking, tools and techniques that any member of the community can use. [3.8.4]
- The FactCheck blog: A fact-checking blog run by the Channel 4 News organization in the UK [3.8,5]
- BBC Reality Check [3.8,6]
- Ferret Fact Service: The first fact-checking organization in Scotland launched in April 2017 following a grant from the Google Digital News Initiative. [3.8,7]

Top fact-checking organizations inUnited States:

- AFP Fact Check USA [3.8,8]
- Climate Feedback, which is dedicated to fact-checking media coverage of climate change [3.8,9]
- FactCheck.org and FactCheckEd.org: describe themselves as “voter advocates seeking to reduce deception and confusion in US politics” and serving as educational resources for teachers and high school students, respectively (the latter was founded in 2005). [3.8,10]
- Fact Checker (The Washington Post): A project of The Washington Post, known for evaluating politicians on the actual accuracy of their statements from zero to four Pinocchios. [3.8,11]
- Media Bias / Fact Check is a website that assesses the accuracy of facts and political bias in the media. The site categorizes media sources according to the spectrum of political bias, as well as the accuracy of their actual reporting. [3.8,12]
- PolitiFact: A service of the Tampa Bay Times - Created August 2007, uses the "Truth-o-Meter" to rank the amount of truth in public persons' statements. 2009 Pulitzer Prize Winner. [3.8,13]
- Snopes focuses on, but is not limited to, validating and debunking urban legends and other stories in American popular culture. [3.8,14]

3.9 Marketing and sales strategy

3.9.1 Competitive advantage analysis (VRIO)

An organization's resource should have four attributes to provide the potential for competitive advantage. These form the VRIN/VRIO characteristics.

Valuable – When resources are able to bring value to the firm they can be a source of competitive advantage

Rare - resources have to deliver a unique strategy to provide a competitive advantage to the firm as compared to the competing firms.

Inimitable – can be sources of sustained competitive advantage if competing firms cannot obtain them.

Owned – built into the culture of the company and fully exploited for its advantage

Compared to competitors: 1 - Competitive disadvantage, 2 - Competitive parity, 3 - Temporary competitive advantage, 4 - Unexploited competitive advantage, 5- Sustained competitive advantage.

Internal Resource	V	R	I	O	Compare to competitors
Mobile application	Y	Y	N		3
System for data collection and aggregation of fact-checking information	Y	N			2
User journey that allows user to check information without leaving his news consumption flow	Y	Y	N		2
Ability to get relevant fact-checking information by request	Y	Y	Y	Y	5
An AI semantic search engine that finds relevant information for the user based on his request	Y	Y	Y	Y	5
Clean brand reputation	Y	Y	Y		3
Modern not overwhelmed design	Y	N			2
Free for use	Y	N			2
Well established relationships with fact-checking organizations	Y	Y	Y/N	N	4

Notification to the user based on the news he has read with relevant information from fact-checking organizations right when it appears.	Y	Y	Y	Y	5
Ability to check information fast from any source you are reading the news on your mobile device.	Y	Y	Y	Y	5

Table 3.1 VRIO analysis

Based on VRIO analysis we can define main competitive of the product:

- An ability to get relevant fact-checking information by request.
- An AI semantic search engine that finds relevant information for the user based on his request.
- Notification to the user based on the news he has read with relevant information from fact-checking organizations right when it appears.
- Ability to check information fast from any source you are reading the news on your mobile device.

Most of them based on the one shared concept of accessibility of fact-checking information based on user request. As a product we pay attention to the natural process of information consumption for users. Others do not understand that, they show all the information about misinformation that happens in the world or locally and this is not how people in our world consume information.

People today consume information in portions. Basically they do not care about all fake news and misleading statements. They need to get answers to their question about what they read right now and here.

But identifying related information is not a trivial task. Fact-checking organisations are good in fact checking and manually analyse tons of news, but not good in recommendation systems and artificial intelligence semantic searching that allow automatically finding relative information for the user.

According to a study by Martin Gilbert, in 1986, a person received a volume of information per qday, which could be placed in 40 newspapers. In 2007, thanks to the Internet and easy access to television, the amount of information increased significantly: the information a person received every day would fit in 174 newspapers which means 335% increase.

Thus, the amount of information and its variability leads us to a certain phenomenon of a new way of consuming information, such as clip thinking.

Clip thinking is considered a process of reflecting many different properties of objects without considering the interrelationships between them, characterized by a fragmented information flow and heterogeneity of incoming information. That also reflects a lack of holistic perception of the surrounding world and the high speed of switching between pieces of information.

The phenomenon of clip thinking is essentially synonymous with the concept of “cognitive style”. We can split cognitive styles into two: differential and integral cognitive styles. They are associated with the individual characteristics of how students consume the teaching material.

Students with an integral type of cognitive style tend to rely on educational technologies built on the principle of transition from the abstract to the concrete. In contrast, learners with a differentiated type of cognitive style tend to learn from a specific accent to a general one.

With the diversity and growing amount of information, the quantity of people who consume information by fragments and build their understanding of the topic from specific to the general significantly exceeds the number of people of another type. That's why being able to give users relevant information and answers that they want to see right now is our main focus and future competitive advantage. [3.9.1,1]

SWOT analysis

Features of the organization itself and its product/service range:

- Strengths – core competencies; features to derive competitive advantage from; what you do best relative to competitors;
- Weaknesses – disadvantages that have to be addressed/overcame; restrict what you can accomplish.

Features of the environment:

- Opportunities – factors that would be beneficial for the company to exploit; have positive impact;
- Threats – external factors which may adversely impact your company.

Strengths	**Weakness**
Expertise in new technologies and semantic search systems. Focusing on the user's request and providing him relevant information based on his request. Ability to process information from any source on a mobile device that the user prefers. User-oriented design.	Not established relationships with fact-checking organizations New unknown brand
Opportunities	**Threats**
Development of a platform for fact-checking organizations where they will effectively share their research and get fair compensation. Development of functionality to highlight fakes and manipulations with the use of AI and no just human analysis. Development of functionality that will helm news outlets and fact-checking organizations to explore information.	Rising bargaining power of suppliers. High cost of new technologies. Undeveloped market

Table 3.2 SWOT analysis

3.9.2 Marketing and sales objectives

Objectives are set specific quantified targets against which the corporate strategy's success can be measured. In order to rightly define Marketing and Sales objectives lets first pay attention to companies Vision and Mission. Vision is a picture of the organisation in the future while a Mission is the unique purpose that distinguishes it from other organisations and defines the boundaries or scope of its activities.

Vision

"Help people make decisions in their lives based on facts, not fakes."

Mission

"Use innovation technologies to help people easily recognize fakes on the information they read every day."

SMART objectives

1. Increase quantity of daily active users to 100,000 till end of 2022
2. Increase number of downloads to 1,000,000 till the end of 2022
3. Get customer retention rate for 30 days higher than 20%
4. Get Stickiness ratio higher than 60% by the end of 2022 (Stickiness ratio = Daily active users / Monthly active users)
5. Get average daily sessions per user higher than 1.1 by the end of 2022
6. Get the average number of screens per session not lower than 3 by the end of 2022
7. Keep average monthly organic flow no lower than 5%
8. Keep customer satisfaction score higher 4.5 (App score in App Store and internal survives)
9. Get 100,00 subscribers to our social media platform
10. Increase amount of fact-checking organization partners to 15 in UK and USA till the end of 2021

3.9.3 Target audience and positioning

The main target audience for our product is socially active young people (18 - 35). Active users of social media and messengers. They follow the news and are interested in politics and social problems, from UK and USA urban areas. They want to be socially responsible and share their political and social personal position through social networks. They have low trust in the news media. Middle-class income.

We already described the social environment of the growing generation in macro analysis. As Gen Z generally cares about social justice and values the truth beyond other things, we consider them the target audience of our product.

They also are the most active users of social networks and messengers. They used to consume information from their feed. Simultaneously they were observers of all political scandals and the growing of fake news spreading. Hence, they have low trust in what they read on the internet and look for alternative ways to prove the information that they read.

Our target market geographically is the UK and the USA, besides reasons related to technical specifications of processing English language and market size. Those are also one with relatively low trust in news media and highly socially active.

Q6_1. Please indicate your level of agreement with the following statement: I think you can trust most news most of the time.
Base: Total sample in each market = 2000, Taiwan = 1027

Figure 3.11. Proportion that agree they can trust most news most of the time [3.9.3,1]

Also, the important thing is their values, intention to social justice, and finding the truth. They have a desire to assert themselves through social media, showing their active citizenship. We expect this to be one of the main drivers to the spreading of our advertisement with important refutation through social networks.

Positioning

To all truth seeker this brand is a technology brand that deliver you feeling of justice and conscious about surrounding world through delivering the truth with use of technologies and community of people who unveiling the truth behind all things

- For those who want to know the real facts we are here to help you
- We know when they try to fool you and we want you to know this as well
- You deserve to know the truth and make your own decisions

3.9.4 Marketing mix

Product

A mobile application and analytical system that allows users to check facts quickly on the news they read every day. With this application, users can check news from any source that is convenient for them (messengers, social networks, online media resources). The design focuses on the user's request and allows him to check information without pushing him to leave his regular news consumption flow.

Brand name: InTruth
Brand logo:

Figure 3.12. Brand Logo

Brand tagline: “Reveal the truth”

Place

Direct distribution. We will use the App Store as the main platform through which we will get to our users.

Price

The focus of the application is on acquiring active users and building up the user base. We plan one of the main advertisement mechanisms to spread our brand through social networks

by users organically through reposting. As the user base is our main target, the application by itself will be freely distributed. The main source of income is contextual native advertising.

Promotion

At the earlier stage, our main goal will be increasing brand awareness. For this purpose, we will start actively developing our social network accounts and spread information about found fake news there.

Primarily we plan to acquire new users through advertisements on social networks. The main reason - this is where our target audience is, also this quite easy to manage and track performance and conversion rate. We will also use google advertisements to target people searching for news and some political and social events.

At a later point during certain political or social events, we plan to start viral advertisements on social networks with a big statement of famous people that eventually was fake information. We will spread its refutation through the internet with the slogan “We know!” and “Reveal the truth!” and link to our app, so people can share this and show their awareness, responsibility, and active social position.

Physical evidence

For physical evidence, we plan to have an office so people can see real addresses and real place. As soon as quarantine regulation ease, we also plan to have regular meetups to discuss different related topics, so this will be a place associated with a brand.

People

As for the people associated with the brand, we will collaborate with famous reporters, journalists, or writers who will share our ideas and values. We will sign contracts with them as ambassadors so that they will be representatives of our brand. Also, we will actively tell our users about our team and show them who they are.

Processes (customer service)

We will create a mechanism for Customer feedback collection inside the app. Also, create a customer support group that will respond to the issues and answer people's concerns about some information.

3.10 Digital technologies

3.10.1 Technological landscape

Figure 3.13. Technological landscape

On the Fig 3.13 is the technological stack that we plan to use for product development. The application will be developed for IOS using Swift. For our Operational mastery, we will use Atlassian products, Jira, and Confluence for knowledge base and documentation.

For Big Data, we will use NoSql Database MongoDB for some particular type of data, and the main DB will be SQL DataBase PostgreSQL.

We will use Git as a version control system through GitHub. As a primary machine learning framework, we plan to use ScikitLearn and Keras, Tensorflow, and PyTorch for deep learning tasks. We will use Tableau and Matplotlib as data visualization tools.

Python will be the primary programming language, and for the backend, we will use light Flask Framework. As we will have a microservices architecture with a high planning load as an event streaming platform, Kafka will be used.

Docker will be used for containerization, and Kubernetes will operate as a container-orchestration system for automating computer application deployment, scaling, and management. Amazon Web Services will be used as a cloud computing provider.

3.10.2 AI semantic searching system

Traditional well-known search engines are based on keywords or statistical search algorithms based on frequency and relevance of keywords. They just do not understand the meaning of words in context. Though pure machine learning technologies can be useful in some cases, they require a lot of time and enormous resources to train them (and continually train to keep them effective over time).

Instead, AI-powered semantic search tools use advanced cognitive functions to understand human language and extract meaningful information from any base of knowledge. Semantics is the study of the meaning of words and phrases and everything related to language. With automatic and deep text understanding, Semantic Technologies can discover the relevant data you need for your business operations, from enterprise analytics to enterprise knowledge management, from customer support to risk management.

Search tools based on artificial intelligence are improving the quality of search results, providing high performance in terms of accuracy (excluding useless information that can cloud the results) and recall (the ability to provide all the results of interest), and also optimize the process of search and exploration making it more accurate, faster and more complete.

Thanks to automatic natural language understanding, combined with a user-friendly and interactive interface, AI applications improve user experience and strengthen online support: semantic search becomes easier.

In addition to improving search and assistance, these tools support companies to analyze, label, enrich and automatically correlate internal and external information to increase the real value of information.

Semantic search tools, powered by artificial intelligence (AI) algorithms, help find relevant data and improve access to the increasing volume of information available on the Internet or in internal repositories.

We will use semantic search to find top relevant information from fact checking organizations based on the users request.

CHAPTER 4. PLANNING AND IMPLEMENTATION

4.1 Team

We will describe the minimal team that we need at the beginning of the project. The size of the team will grow with new stages of the project correspondingly to the growth of the project itself. More detailed information about the team will be described in financial model Personnel assumptions.

1. CEO
2. CTO
3. Python back-end software developer
4. Swift software developer
5. Project manager
6. Data Science lead
7. ML engineer
8. QA engineer
9. DevOps engineer
10. UI/UX designer
11. Business Developer journalist
12. Marketing manager
13. Communication (PR) manager
14. Product analyst

4.2 Project Implementation Plan and KPIs

Phase	Description	Date	KPIs & milestones
Preliminary developing stage	Find CTO and create connections with the USA, UK Journalists Business Developer. Establish connections with fact-checking organizations and polish business plan and presentation.	May 2021	Polished presentation and business plan Established first connections with fact-checking orgs.
Seed-investing	Seed capital is an investment made at the preliminary stage of the startup. This helps the business in identifying and creating a perfect direction for its startup. We will use this money for MVP development and reach the market.	Jun - Jul 2021	Expected amount of seed investment 250,00 USD
Developing stage	Hire a core developing team. Development of MVP product. Development of Mobile application UI Development of a System for collecting data from fact-checking organizations. Development of a System for processing and storing data. Development of notification functional Development of the first version of AI semantic search and data processing system	Aug - Dec 2021	System reliability System capability Amount of defects Time of learning Speed of response Speed of data collection Implemented all basic functionality, system is capable to work with more than 10000 daily users
Launch	Hire marketing specialists Launch product in USA and test first product hypothesis. Improve application, focus on retention, stickiness, and customer satisfaction. Strengthen relations with fact-checking organizations.	Jan 2021 - Feb 2022	Retention Stickiness ratio Daily sessions per user App rate Organic flow

			Amount of fact-checking organization partners 10 Amount of downloads DAU - higher 9,000
Venture investment	When the products reach the market, we will seek venture capital funding. We will use this money for further product development, improve design, reliability, and scalability. Starting aggressive marketing and community management.	March - April 2022	Expected amount of venture investment 600,000 USD
Development stage 2	Improving product design, reliability, and scalability. Actively test product hypotheses focus on retention and customer satisfaction. Monetization system test and development. Marketing activity focuses on brand awareness and steady user growth.	May - Aug 2022	System scalability - up to 10000 requests/s Accessible and reliable 99.9% of the time Quality of AI model results Customer retention higher than 20% Stickiness ratio higher than 60% Daily sessions per user higher than 1.1 Average number of screens per session not lower than 3 Customer satisfaction score higher 4.5

Active acquisition and growth	Development marketing strategy and start active user acquisition during US election. Target the US market and run a viral advertising campaign. Working monetization.	Sept - Dec 2022	Retention Cost of acquisition Number of followers to our brand pages in social networks Number of downloads to 1,000,000 Stickiness ratio higher than 60% Quantity of daily active users higher than 100,000
Round A investing Scaling Developing new markets	After growth, we will seek for round A investment.	2023	

Table 4.1 Implementation plan

4.2 Sales and revenue forecast

Sales and Acquisition Assumptions		
Average CPV (Cost Per View) USD		0.0075
Average CPA (Cost Per Acquisition) USD		1.1
Average CPM (Cost per mile) USD		7.5
Monthly organic growth rate		0.07
Average screens per session		3
Average sessions per day		2
Monthly organic growth rate stage 2		0.26

Table 4.2. Sales and Acquisition Assumptions Part 1

Sales and Acquisition Assumptions	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
DAU (Daily Active Users) quantity (connected to marketing expenses)	-	909	7,770	16,586	36,266	96,595	159,971
Revenue from advertisement	-	-	-	68,070	148,838	396,426	656,523

Table 4.3. Sales and Acquisition Assumptions Part 2 (Based on advertisement expenses)

4.3 Financial model

4.3.1 Background Assumptions

Background Assumptions	
Company Name	InTruth
Annual Nominal Interest Rate earned on Cash	0.5%
Annual Nominal Interest Rate on Short-Term Debt	3.5%
Annual Nominal Interest Rate on Long-Term Debt	5.5%
Federal Tax Rate	35.00%
State Tax Rate	5.00%
Average Useful Life of Gross PP&E in Years	5

Table 4.4. Background Assumptions

4.3.2 Personnel Assumptions

Personnel Assumptions			**Q3 2021**	**Q4 2021**	**Q1 2022**	**Q2 2022**	**Q3 2022**	**Q4 2022**
Senior Management Compensation	Base Annual Salary	Benefits						
CEO	50,000	25.0%	15,625	15,625	15,625	15,625	15,625	15,625
CTO	50,000	25.0%	15,625	15,625	15,625	15,625	15,625	15,625
Total Senior Management Salaries & Benefits			**31,250**	**31,250**	**31,250**	**31,250**	**31,250**	**31,250**
Total Senior Management Headcount			**2**	**2**	**2**	**2**	**2**	**2**

Business Development Compensation	Base Annual Salary	Benefits						
Manager	35,000	15.0%	10,063	10,063	10,063	10,063	10,063	10,063
Associate	35,000	10.0%	-	-	-	-	-	-
Total Business Development Salaries & Benefits			**10,063**	**10,063**	**10,063**	**10,063**	**10,063**	**10,063**
Total Business Development Headcount			**1**	**1**	**1**	**1**	**1**	**1**

Marketing Compensation	Base Annual Salary	Benefits						
Marketing Manager	48,000	25.0%	-	10,000	15,000	15,000	15,000	15,000
Communication (PR) manager	36,000	10.0%	-	6,600	9,900	9,900	9,900	9,900
Product Analyst	30,000	10.0%	-	-	-	5,500	8,250	8,250
Total Marketing Salaries & Benefits			**-**	**16,600**	**24,900**	**30,400**	**33,150**	**33,150**
Total Marketing Headcount			**-**	**1**	**2**	**3**	**3**	**3**

Product Development Compensation	Base Annual Salary	Benefits						
Manager	36,000	5.0%	6,300	9,450	9,450	9,450	9,450	9,450
Swift SE	42,000	5.0%	7,350	11,025	11,025	11,025	11,025	11,025
Python Backend SE	42,000	5.0%	7,350	11,025	11,025	11,025	11,025	11,025
Python Backend SE	28,000	5.0%	-	-	-	7,350	7,350	7,350
UI/UX Designer	44,000	5.0%	11,550	11,550	11,550	11,550	11,550	11,550
Data Science Lead	30,000	5.0%	-	-	7,875	7,875	7,875	7,875
ML Engineer	42,000	5.0%	3,675	11,025	11,025	11,025	11,025	11,025
QA Engineer	24,000	5.0%	-	6,300	6,300	6,300	6,300	6,300
DevOps Engineer	37,000	5.0%	-	9,713	9,713	9,713	9,713	9,713
Swift SE	48,000	5.0%	-	-	-	12,600	12,600	12,600
Python Backend SE	48,000	5.0%	-	-	-	12,600	12,600	12,600
Total IT Salaries & Benefits			**36,225**	**70,088**	**77,963**	**110,513**	**110,513**	**110,513**
Total IT Headcount			**3**	**7**	**8**	**11**	**11**	**11**

Other Compensation	Base Annual Salary	Benefits						
Legal Support	48,000	25.0%	5,000	5,000	5,000	5,000	5,000	10,000
Finance Associate	24,000	15.0%	-	2,300	6,900	6,900	6,900	6,900

HR Associate	36,000	10.0%	-	-	-	6,600	9,900	9,900
Administrator	19,000	10.0%	5,225	5,225	5,225	5,225	5,225	5,225
Total Other Salaries & Benefits			**10,225**	**12,525**	**17,125**	**23,725**	**27,025**	**32,025**
Total Other Headcount			**1**	**2**	**2**	**3**	**3**	**4**

Total Salaries & Benefits			**87,763**	**140,525**	**161,300**	**205,950**	**212,000**	**217,000**
Total Headcount			**8**	**13**	**15**	**20**	**20**	**21**

Table 4.5. Personnel Assumptions

4.3.3 Income Statement

Income Statement	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Revenue from advertisement	-	-	-	68,070	148,838	396,426	656,523
Other Revenues	-	-	-	-	-	-	-
Total Revenues	-	-	-	68,070	148,838	396,426	656,523
Cost of Goods Sold							
Total Business Development Salaries & Benefits	-	-	-	-	-	-	-
Other Costs of Goods Sold	-	-	-	-	-	-	-
Total Cost of Goods Sold	-	-	-	-	-	-	-
% of Revenues	-	-	-	0.0%	0.0%	0.0%	0.0%
Gross Income	-	-	-	68,070	148,838	396,426	656,523
% of Revenues	-	-	-	100.0%	100.0%	100.0%	100.0%
Sales & Marketing Expenses							
Total Salesperson Salaries & Benefits	-	-	-	-	-	-	(27,375)
Total Marketing Salaries & Benefits	-	(16,600)	(24,900)	(30,400)	(33,150)	(33,150)	(33,150)
Public Relations	-	(250)	(1,050)	(1,250)	(1,900)	(3,000)	(3,000)
Advertising	-	(3,000)	(6,500)	(9,000)	(18,000)	(24,000)	(24,000)
Other Sales & Marketing Expenses	-	-	-	-	-	-	-
Total Sales & Marketing Expenses	-	(19,850)	(32,450)	(40,650)	(53,050)	(60,150)	(87,525)

% of Revenues	-	-	-	59.7%	35.6%	15.2%	13.3%
General & Administrative Expenses							
Total Senior Management Salaries & Benefits	(31,250)	(31,250)	(31,250)	(31,250)	(31,250)	(31,250)	(31,250)
Total IT Salaries & Benefits	(36,225)	(70,088)	(77,963)	(110,513)	(110,513)	(110,513)	(110,513)
Total Other Salaries & Benefits	(10,225)	(12,525)	(17,125)	(23,725)	(27,025)	(32,025)	(37,025)
Total Business Dev Salaries & Benefits	(10,063)	(10,063)	(10,063)	(10,063)	(10,063)	(10,063)	(10,063)
Rent Expenses	(4,500)	(4,500)	(6,000)	(9,000)	(9,000)	(9,000)	(9,000)
Utilities Expenses	(1,500)	(1,500)	(2,250)	(2,250)	(3,000)	(3,000)	(3,000)
Cloud servers	-	(1,055)	(3,466)	(3,995)	(5,176)	(8,796)	(12,598)
Other	-	-	-	-	-	-	-
Total General & Administrative Expenses	(93,763)	(130,980)	(148,116)	(190,795)	(196,026)	(204,646)	(213,448)
% of Revenues	-	-	-	280.3%	131.7%	51.6%	32.5%
Depreciation Expense	(860)	(1,445)	(1,835)	(2,385)	(3,060)	(3,535)	(4,160)
Total Operating Expenses	(94,623)	(152,275)	(182,401)	(233,830)	(252,136)	(268,331)	(305,133)
Operating Income	(94,623)	(152,275)	(182,401)	(165,760)	(103,298)	128,095	351,390
% of Revenues	-	-	-	(243.5%)	(69.4%)	32.3%	53.5%
EBITDA	(93,763)	(150,830)	(180,566)	(163,375)	(100,238)	131,630	355,550
% of Revenues	-	-	-	(240.0%)	(67.3%)	33.2%	54.2%

Interest Expense	-	(28)	(652)	-	-	(71)	-
Interest Income	-	4	93	-	-	10	-
Pre-Tax Profit (Loss)	(94,623)	(152,299)	(182,960)	(165,760)	(103,298)	128,034	351,390
% of Revenues	-	-	-	(243.5%)	(69.4%)	32.3%	53.5%
Add (Subtract) to Tax Loss Carryforward	94,623	152,299	182,960	165,760	103,298	(128,034)	(351,390)
Taxable Income (Loss)	-	-	-	-	-	-	-
Tax Expense	-	-	-	-	-	-	-
Net Income	(94,623)	(152,299)	(182,960)	(165,760)	(103,298)	128,034	351,390
% of Revenues	-	-	-	(243.5%)	(69.4%)	32.3%	53.5%

Table 4.6. Income Statement

4.3.4 Balance Sheet

Balance Sheet	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Assets							
Cash	135,938	54,475	385,058	197,040	74,000	131,676	439,803
Accounts Receivable	-	-	-	14,143	33,593	86,338	121,760
Inventory	-	-	-	-	-	-	-
Total	135,938	54,475	385,058	211,183	107,593	218,014	561,563
Gross PP&E	20,300	33,200	39,200	49,700	65,200	74,200	86,200
Accumulated Depreciation	(860)	(2,305)	(4,140)	(6,525)	(9,585)	(13,120)	(17,280)
Net PP&E	19,440	30,895	35,060	43,175	55,615	61,080	68,920
Intangibles	-	-	-	-	-	-	-
Total Assets	**155,378**	**85,370**	**420,118**	**254,358**	**163,208**	**279,094**	**630,483**
Liabilities & Shareholders Equity							
Revolver (Short-Term Debt)	-	82,291	-	-	12,148	-	-
Accounts Payable	-	-	-	-	-	-	-
Total Current Liabilities	-	82,291	-	-	12,148	-	-
Long-Term Debt	-	-	-	-	-	-	-
Total Liabilities	-	82,291	-	-	12,148	-	-
Paid-in Capital	250,000	250,000	850,000	850,000	850,000	850,000	850,000
Retained Earnings	(94,623)	(246,921)	(429,882)	(595,642)	(698,940)	(570,906)	(219,517)
Total Shareholder's Equity	155,378	3,079	420,118	254,358	151,060	279,094	630,483
Total Liabilities & Shareholder's Equity	**155,378**	**85,370**	**420,118**	**254,358**	**163,208**	**279,094**	**630,483**
Off-Balance Sheet Items							
Tax Loss Carryforward	94,623	246,921	429,882	595,642	698,940	570,906	219,517

Table 4.7. Balance Sheet

4.3.5 Cash Flow Statement

Cash Flow Statement	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Cash Flow from (to) Operations							
Net Income	(94,623)	(152,299)	(182,960)	(165,760)	(103,298)	128,034	351,390
Depreciation Expense	860	1,445	1,835	2,385	3,060	3,535	4,160
Change in A/R	-	-	-	(14,143)	(19,450)	(52,745)	(35,422)
Change in A/P	-	-	-	-	-	-	-
Change in Inventory	-	-	-	-	-	-	-
Change in Intangibles	-	-	-	-	-	-	-
Total Cash Flow from (to) Operations	(93,763)	(150,854)	(181,125)	(177,518)	(119,688)	78,824	320,127
Cash Flow from (to) Investing							
Workstations (Computers & Desks)	(10,800)	(8,400)	(1,500)	(6,000)	(1,500)	-	(3,000)
Technology Equipment	(5,000)	-	-	-	(5,000)	-	-
Other Miscellaneous Items	(4,500)	(4,500)	(4,500)	(4,500)	(9,000)	(9,000)	(9,000)
Total Cash Flow from (to) Investing	(20,300)	(12,900)	(6,000)	(10,500)	(15,500)	(9,000)	(12,000)
Cash Flow from (to) Financing							
Revolver Issuance / (Repayment)	-	82,291	(82,291)	-	12,148	(12,148)	-
Long-Term Debt Issuance / (Repayment)	-	-	-	-	-	-	-
New Equity Investments	-	-	600,000	-	-	-	-
Dividends	-	-	-	-	-	-	-
Total Cash Flow from (to) Financing	-	82,291	517,709	-	12,148	(12,148)	-
Beginning Cash	250,000	135,938	54,475	385,058	197,040	74,000	131,676
Change in Cash	(114,063)	(81,463)	330,583	(188,018)	(123,040)	57,676	308,127
Ending Cash	135,938	54,475	385,058	197,040	74,000	131,676	439,803

Table 4.8. Cash Flow Statement

4.3.6 Debt

Debt	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Cash Flow available for Financing	(114,063)	(163,754)	(187,125)	(188,018)	(135,188)	69,824	308,127
New Equity Investments	-	-	600,000	-	-	-	-
Dividends	-	-	-	-	-	-	-
Beginning Cash	250,000	135,938	54,475	385,058	197,040	74,000	131,676
Minimum Cash	(29,254)	(46,842)	(53,767)	(68,650)	(70,667)	(72,333)	(83,125)
Cash Flow available for Debt Repayment	106,683	(74,658)	413,583	128,390	(8,815)	71,491	356,678
Long-Term Debt Issuance / (Repayment)	-	-	-	-	-	-	-
Cash Flow available for Revolver Repayment	106,683	(74,658)	413,583	128,390	(8,815)	71,491	356,678
Long-Term Debt Beginning Balance	-	-	-	-	-	-	-
Long-Term Debt Issuance / (Repayment)	-	-	-	-	-	-	-
Long-Term Debt Ending Balance	-	-	-	-	-	-	-
Long-Term Debt Interest Expense	-	-	-	-	-	-	-
Revolver Beginning Balance	-	-	82,291	-	-	12,148	-
Revolver Issuance / (Repayment)	-	82,291	(82,291)	-	12,148	(12,148)	-
Revolver Ending Balance	-	82,291	-	-	12,148	-	-
Revolver Interest Expense	-	28	652	-	-	71	-

Table 4.9. Debt

4.3.7 Summary

Summary	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Total Revenues	-	-	-	68,070	148,838	396,426	656,523
Total Cost of Goods Sold	-	-	-	-	-	-	-
Total Operating Expenses	(94,623)	(152,275)	(182,401)	(233,830)	(252,136)	(268,331)	(305,133)
EBITDA	(93,763)	(150,830)	(180,566)	(163,375)	(100,238)	131,630	355,550
Interest Expense	-	(28)	(652)	-	-	(71)	-
Net Income	(94,623)	(152,299)	(182,960)	(165,760)	(103,298)	128,034	351,390
Cash	135,938	54,475	385,058	197,040	74,000	131,676	439,803
Total Assets	155,378	85,370	420,118	254,358	163,208	279,094	630,483
Revolver (Short-Term Debt)	-	82,291	-	-	12,148	-	-
Long-Term Debt	-	-	-	-	-	-	-
Total Shareholder's Equity	155,378	3,079	420,118	254,358	151,060	279,094	630,483
Total Headcount	9	15	16	20	21	21	23
Total Salaries & Benefits	33,538	54,475	57,100	69,000	74,000	74,000	83,125

Table 4.10. Financial Summary

Break even point - October 2022 (15 month after project starts)

1.5 mln USD of retained earnings by 2024

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