Alma Mater Studiorum - Università di Bologna
Curriculum: Business and Administration
32763 - DUE DILIGENCE LAB

PART 1 – BUSINESS DESCRIPTION

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COMPANY DESCRIPTION

We want to develop an application based on artificial intelligence, specifically on **natural language processing** (NLP), natural language understanding (NLU), natural language generation (NLG), machine learning, **descriptive** and **diagnostic** analytics as the technologies we are relying on, that will be provided by therapists to their patients. We aim to provide a more efficient, faster, and more reliable therapy process and diagnosis.

Industry: Healthcare Information Technology
Sub-industry: Mental Health Applications

Services

1. **CHATBOT** - The patient has a daily conversation with our AI called MIRA, which tracks his/her emotions based on words recognition and tone of voice, identifying unusual emotional peaks. The AI self-learns by data gathering and consequently provides guidance (ex: advising meditation, panic attack management, relaxation techniques, workouts, recreational activities such as taking a walk, etc).

2. **REPORT GENERATION** - The AI sends a weekly report to the therapist based on the data gathered, who will download and analyze it before each appointment. Therapists have access to an app section that explains them reports: they are distributed in a uniform and standardized manner for all therapists with outputs easy to read and interpret (graphs, keywords). The analytics of the report will be based on **descriptive and diagnostic analysis.**

3. **COMMUNITY** – MIRA app includes a forum where people can share their experience with the AI, express solidarity, and encouragement, empathize and ask or give support from/to peers.

Technical details

Based on the number of patients enrolled in the therapy process, each therapist will register a number of IDs on a specific section of the application. In this way, a specific group of IDs will be linked to only one therapist, who will function as a centralized server to receive all the data from his/her patients by the AI.

The patients can agree to have access to this service (our app) or even decide to disagree.

In the case the patient agrees, the therapist will give the ID to his/her patients.

Once the patient will download the app, he/she can insert the ID which is specifically connected to the therapist assigned and begin the daily parallel therapy with the AI.

The patients that will use our app in year 0 will be given one-year free trial for the following reasons:

- Skepticism about the efficacy of the application in its experimental stage and one-year free trial could increase patient willingness to try.
- Year 0 is specifically planned to be entirely focused on R&D and data gathering: this process will lead our app to rely on a larger and more consistent volume of data starting from Year 1 when the technology will be charged to consumers.
- AI adopts "learning by doing" process through machine learning, thus requiring time and need for high monitoring during this stage. Thanks to this type of technology, AI will be adapted to the patient's needs and personality, generating familiarity and confidence after one year. Personalization will increase over time and cancelling the subscription would mean losing this value-added. In fact, as time goes by, as the marginal value increases, the user switching costs will increase as well, hence a greater retention rate.

Why Mira?

1. **Time optimization-** Since it usually takes on average 10-15 minutes to update the therapist about last events, with MIRA time will be optimized during each single therapy session. The therapists indeed will be updated about each day of the past week of the patient experience before the appointment in a concise and simple manner hence avoiding time waste.

2. **Availability 24h per day-** The patient will rely on MIRA as "extension of the therapist", that is always available. In this way, the patient might financially benefit from our service in the short term and long term, eventually reducing therapy process thanks to our service.

3. **Money saving**. The patient will financially benefit in the long term as well. Time saving of therapy sessions and the quality of the service offered should enable patients to need less meetings. (In the long-term, we expect to reduce on average one session per month hence in one month, this can imply a cost saving of $100 to $200 dollars for a patient, since this is the estimated cost per session in US.)

4. **Social contribution.** Accepting Our Terms & Conditions, our clients will socially contribute by agreeing to sell their anonymous data to research Institutions as well as sharing experience with others through the forum.

Subscription-based model

Our main sources of revenues would come from each yearly subscription paid by the patients and from selling anonymous data gathered by AI to research institutions, universities, any other body related to the neuropsychiatric field.

After one-year free trial in year 0, the patient will link his/her credit card to the application and will be charged $120,00 per year.

Distribution Channels

1. Partnership with therapists- The service is free for therapists. We will make a partnership with therapists to promote our product to their patients. It is a win-win situation because we can directly reach our target group and therapists can provide more effective therapy session to their clients thanks to reports tracking the emotional condition of the patient over the week. Effectiveness will come from the availability of more data on the person outside therapy and thus the opportunity to take better data-driven decisions. Moreover, the therapist will be able to better diagnose mental issue and faster. This implies **better success rates** as periodic data improve the effectiveness of treatments and the accuracy of diagnoses. Eventually, creating a **network effect** that bring new patients.

2. Apple store and Play Store - The app can be easily downloaded from the Apple Store and Play Store, so it will be available for both iOS and Android systems.

3. Social Media Communities - Mira will be promoted on Facebook and Instagram, also thanks to the involvement of psychologist influencers.

Milestones

- From 5th year, an "upgraded" version of the app will be developed, which provides a partnership with museums, gyms, art galleries, botanic gardens and other venues which are helpful to patient health. We aim to partner initially in the US and further internationally.

- From 8th year, we are going to develop an extended version of the app for VR technologies, where MIRA will finally be represented as a hologram to talk with directly in a dedicated virtual space.

INDUSTRY ANALYSIS AND LATEST TRENDS

Mental health industry and Healthcare software industry

Over the last decade there has been a constant increase in demand for mental health services, led by the ever-increasing stress levels of everyday life as well as the greater awareness surrounding the issue. Worsening socio-economic factors are playing a remarkable role in driving up the number of episodes of stress, depression, and anxiety. Growing inequality, social exclusion/isolation, poverty and lately climate change are not but a few examples of the causes that are deteriorating our mental health. The trend has been accelerated by major events like the COVID-19 pandemic and the Russia-Ukraine war. From 2020 to 2021, in the US alone, professionals in the field have reported increases of 82% in treatments for anxiety, 70% for depression and 58% for trauma and stress.

Following 2020, 41% of respondents said that their mental health is average or worse. On younger people in particular, the last years have taken a significant emotional toll. In fact, 94% of people aged 18-24 said they experience mental health problems sometimes or often. In this sense, the increasing awareness towards the importance of mental health has certainly helped in addressing the problem. People are now more encouraged to speak out, ask for help and go over the stigma that historically affected the topic. Normalizing the problem is an important first step although, so far, the effort has not been followed by an **adequate follow-through** in terms of accessibility to Mental Health services and infrastructures. Specifically, the last couple of years has uncovered several criticalities affecting industry:

- **Limited capacity**, therapists have not been able to accommodate all requests for support,
- **Inadequate instruments** to adapt to the excess demand. Tools to speed up treatments, ensure operational efficiency or make therapy more flexible. Switching to on-distance appointments was a start but not nearly enough.
- **Excessive workloads** are affecting therapists' well-being and disrupting their operations.
- Access to mental health services and support **does not come cheap**. In the US, an hour of therapy sessions ranges from $100 to $200.
- **Time constraints:** the impossibility to fit therapy sessions within day-to-day routine and interact with professionals often enough.
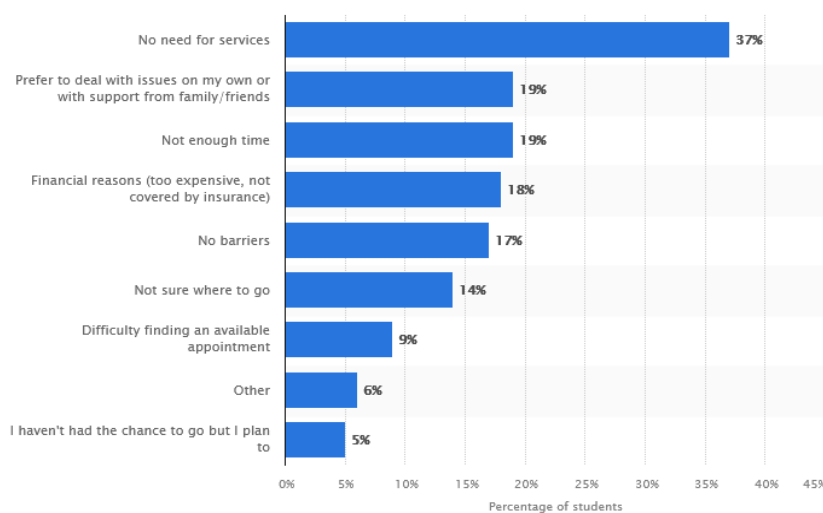
Indeed, according to a study conducted by Statista, out of 103.748 college students interviewed, many reported primarily lack of time, financial issues or even difficulties in fixing an appointment or in deciding which professional to rely on.

This situation has created some major bottlenecks and operational inefficiencies in the mental healthcare field:

1.Population is, more and more often, not treated equally in terms of mental health services. It is necessary to redistribute the demand effectively, either by alleviating the weight on the professionals or increasing the capacity. As of now, service seekers are put on endless waiting lists and often end up discouraged from asking for help.

2.Many eventually decide to stop seeking help because they cannot afford it or are not able to undertake a therapeutic path because they cannot dedicate enough time to it. Ergo, there are many individuals willing to invest in their mental well-being but cannot access the services.

These bottlenecks are resulting in people not being able to take care of their mental health. **Untreated mental illness** is a burden that affects an individual's personal life, family, work environment. The National Alliance on Mental Illness estimates that untreated mental illness already costs us up to **$300 billion annually** due to lost productivity and associated costs due to absenteeism, employee turnover and increases in medical and disability expenses. Both mental health service seekers and providers have been attempting to find solutions to issues affecting the industry. Both their efforts point towards a more profound digitalization of the healthcare industry.

Where Service providers are trying to find methods to cope with capacity or improve the accuracy of their treatments and diagnosis, service seekers have instead been turning to less conventional methods of emotional support. In fact, burdened by lack of money, time or professionals, many are becoming more willing to try digital solutions. For instance, Mental Health apps are experiencing significant growth. Deloitte reports that the market is set to reach $500 mln in spending by the second half of 2022, according to **conservative estimates.** A reason behind the exceptional growth of the sector appears to be the **easy accessibility of the apps.** Unlike several fitness apps for instance, they are **often free,** and they can be easily integrated within one's everyday routine. In the US, where conventional therapy is not accessible to all ethnic groups, apps manage to spread among the segments of population that are less wealthy or where mental health is still stigmatized. According to a report, Americans prioritize empathetic, non-judgmental support when disclosing their issues (42%), access to care at any time (43%), ease of use (40%), the ability to use them as much or as little as needed (39%), good value for money (38%), and the convenience of accessing care on one's own terms (38%) were the main reasons given by those who expressed interest in mental health chatbots.

Spending on emotional well-being apps (in US$ millions)
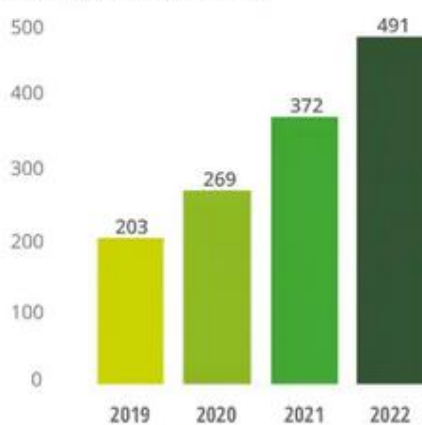
As of 2021, there are more than 20.000 mental health apps around the world and most of them revolve around meditation and mental health awareness, self-management, and self-learning. These applications are based on techniques such as **Cognitive behavioral therapy** and **Acceptance Commitment Therapy**, in some cases, complemented by AI chatbots**.** Although one might use them for such purposes, these apps are not capable or meant to replace in-person psychology and therapist sessions (yet). More than 800 million worldwide suffering from mental health issues and increasing attention towards the topic, the market has enormous potential. Considering that mental health conditions are strictly correlated to demographic trends, it also stands to keep on growing.

A report released by a leading startup in the sector (*Woebot Health*) shows that, in 2021, 47% of Americans are interested in employing a mental health chatbot or AI therapist and that more than half of Americans (58%) said they would be willing to use such an advanced technology along with a human mental health therapist if scientifically tested.

AI in Mental Health - According to Insider Intelligence, AI in healthcare will expand at a rate of 48% annually between 2017 and 2023.

MARKET ANALYSIS

The potential market for Mental health apps is considerable in the US and our planned headquarter will be based in **San Francisco, California (US)**.

MIRA is targeting people suffering from neurotic mental illness that goes to therapy or rely on digital mental health services independently or have the intention to go the therapist.

In 2022, the US adult populations counts 258 million adults (above 14 years old). According to Deloitte, 20% of Americans adults are currently experiencing mental illness, so to say **50 million** Americans. In 2020, around **41.4 million adults** in the US received treatment or counselling for their mental health within the past year (Statista). According to the National Alliance on Mental Health, **26.3 million** adults received virtual mental health services in the past year. Thus, we can assume that out of the 50 million Americans suffering mental illness, 52% could also be interested in using digital solutions.

According to Deloitte, the mental health apps market increased by **54,6%** in a span of 2 years from 2019 to 2021. The market is estimated to witness a y-o-y growth of approximately 20% to 22% in the next 5 years, with a CAGR of 16,5% from 2022 to 2030. A conservative figure, considering the 32% growth these apps enjoyed during the pandemic. North America dominated the market with a revenue share of over 35% in 2021.

Conducting industry analysis, we discovered 8 companies offering the same or similar service as MIRA. (see Appendix A for details) Current market situation shows that apps are either solely AI chatbot based or online therapy services whereas our value proposition is in the middle. Moreover, the companies in this market have similar employee size (up to 1000) and similar user size (up to 100 million).

The similarity we have with these companies lies in the target group although we do not represent an exchange for therapists. Hence, we will consider as our direct competitors Wysa, Weobot and Hapify whereas the others still present indirect competition since they represent substitute products.

RISKS

When it comes to creating an app involving artificial intelligence, it may also give rise to a series of unwanted, and sometimes serious, risks that can be split into internal and external ones.

Internal risks include:

- **skills shortage** and the availability of technical staff with the experience and training necessary to effectively develop the applications.
- **complexities involved in knowledge acquisition, validation and maintenance**. AI systems depend on the data they are trained on and some of them may be susceptible to biases in the input data and limitations in the training data sets. Consequently, the app might develop its own rules and make its own inappropriate decisions.
- **increased initial costs, operational and maintenance costs**, and uncertain financial benefits

External risks instead involve:

- **trust of AI technology** - both patients and therapists might be sceptical that AI can understand patients' moods and effectively simplify decisions.
- **ethical and legal issues** - certification and regulatory approval of AI technologies, including FDA approval processes, have to come the fore as healthcare organizations grapple with deciding whether or not to include AI technologies into regular practice
- **data privacy and consumer consent** - business models built to gather health data may share or sell user data for marketing or other purposes for which the user may not understand or be able to foresee.
- **lack of interest from research institutions** that believe that similar apps can lead to descriptive errors and misdiagnoses.

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INDUSTRY ANALYSIS

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	Value proposition	Year foundation	User base	Market	Funds raised	Firm size (employee numbers)	Price
Wysa	**AI-based conversational chatbot** that has been trained <u>using</u> 100-million odd conversations to understand user inputs. The app provides research-backed, widely used techniques like cognitive behavioral therapy (CBT), dialectical behavioral therapy (DBT), and meditation support for users with depression, stress, anxiety, sleep and other mental health needs. Target individuals	2017	3,5 million 30-Day Downloads: 11.938	Worldwide operations in more than 60 countries.	$9.4 million, 4 rounds of financing	106	$7,40 /month $46 /year (Engaging with the app is free and available 24×7, but accessing a human coach via the app is a paid service)

	and employees.						
Ginger	We're reinventing mental healthcare by coupling data science and virtual delivery to provide immediate, personal support for anyone. Get real-time support via text with a **behavioral health coach day or night, 365 days a year (chatbox)**. **Licensed therapists and psychiatrists are available for regular video** sessions, when needed.	2011	25 million through leading employers, health plans, and partners.	50 states	$1.1 billion (current valuation)	251-500	starting at $149 and scaling up to $249 and $349 per month depending on how much access your company requires.
Woebot	Provides a **talk therapy chatbot that monitors the user's mood** with the help of NLP and psychologic	2017	refuse to say publicly	US based but apparently operating everywhere	$123.3 million funds raised so far (unknown series)	51-100	$39 (now it is venture funded so it is free)

	al skills, mainly in Cognitive Behavioral Therapy (CBT). This bot asks the user how things are going in their life quickly and then stores the text and responses received. **These conversations are studied, and slowly with time; the bot asks more specific questions based on past conversation.**						
Happify	A platform that combines the latest science on treating depression and anxiety with the underlying mechanics of basic **video games** to create a self-care service. It	2012	N/A	Global user base	$117.72million	244	$14.99/ month or $139.99/ year + also has a free version.

	has built an **AI coach named Anna that models real-world interactions with a therapist**						
Calm	Calm is a popular sleep, meditation, health, and happiness app based on Machine Learning.	2012	100 million	Global user base	From $0 to a $1 Billion Valuation in 7 Years	50	7-day free trial with an annual membership for around $70
BioBeat	The BioBeat app's core component is an eight-week course consisting of coaching topics, exercises, audio sessions and surveys powered by an AI system. It is also connected t o a wearable known as a BioBeam, which collects data such as heart rate variability, sleep efficiency	2012	N/A	Global user base	More than $3 million	51-100	N/A

	and levels of activity.						
Sanvello	Sanvello is a mental telehealth app that uses the clinically backed principles of cognitive behavioral therapy (CBT) and mindfulness meditation to help users with anxiety, depression, and stress. **Sanvello does offer a therapy service with licensed therapists as well**, but this isn't included in the subscription cost. Therapy services are charged on a per-appointment basis.	2019	37 million	Global user base		51-200	$8.99 per month or $53.99 per year. Therapy sessions are also available but are not included in the subscription. The price ranges from $85 to $140 per appointment without insurance
Talkspace	**Online text and video chat therapy platform** that offers access to	2012	46.000 active users	Global user base	Went public in 2021, valuation today of $1.4 billion.	782	From $260 a month to access chat and text up to $396 per month

	therapists who cover a broad range of <u>mental health services</u>. The company uses <u>machine learning</u> and <u>artificial intelligence</u> tools to analyze anonymized transcripts of therapy sessions in order to improve services.						with 4 therapy sessions a month.