Group Part

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Strategic Business Models Field Lab: Analysis of Digital Therapeutical Business Models based on Cognitive Behavioral Therapy in the Digital Mental Health Industry – Methodology and Evolution of the Industry

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Abstract

Macroenvironmental drivers significantly increased the number of mental health issues in previous years, prompting a particular focus on digital therapeutic business models to close the gap in mental care. This thesis provides insights into the development and variation of business models in the digital mental health industry, along with a focus on digital therapeutical business models based on cognitive behavioral therapy. The work examines the business models' essential elements, advantages, and vulnerabilities. Three recommendations are derived from analyzing internal and external weaknesses, allowing business model providers to strategically optimize their services, customer relationships, and competitive positioning.

Keywords: Strategy, Business Model, Business Model Innovation, Digital Mental Health, Digital Therapeutics, Cognitive Behavioral Therapy (CBT)

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List of Abbreviations

B	
BFARM:	Federal Institute for Drugs and Medical Devices
BM:	Business Model
C	
CAGR:	Compound Annual Growth Rate
CBT:	Cognitive Behavioral Therapy
D	
dCBT:	Digital Cognitive Behavioral Therapy
DIGA:	Digital Health Application
O	
OECD:	Organization for Economic Cooperation and Development
P	
P2P:	Peer-to-Peer
W	
WHO:	World Health Organization

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1. Introduction

"(...) mental health... is not a destination but a process. It's about how you drive, not where you're going. The therapist is like a driving instructor, not a chauffeur."

(Shpancer 2010)

When Noam Shpancer, a clinical psychology professor, made this statement, he demonstrated that mental health is a process that can be achieved with the right support. Since one in two people will experience a mental illness throughout their life, there is a growing understanding of the importance of mental health in today's society. This understanding is based on the OECD's finding that mental illnesses can significantly affect people's lives, their families, and their communities (Scarpetta, Colombo, and Hewlett 2021).

As uncertainties rised with the outbreak of the Covid-19 pandemic, the lockdowns, and the ongoing war in Ukraine, the demand for mental health and psychological care has increased even more (Scarpetta, Colombo, and Hewlett 2021). According to research by the Global Burden of Diseases, Injuries, and Risk Factors in 2020, people's mental health worsened during the Covid-19 crisis. Before the pandemic, 298 million individuals had anxiety disorders, and 193 million had severe depressive disorders. Initial projections indicate a rise to 246 million cases of severe depression and 374 million cases of anxiety disorders after accounting for the Covid-19 pandemic. This indicates an increase of 28% for depressive disorders and 26% in anxiety disorders in just one year (Santomauro et al. 2021). This significant rise in the number of persons affected challenges mental health care delivery. According to a WHO study conducted in 2020, more than 60% of nations experienced delays in mental care, with up to 67% reporting interruptions in counseling and psychotherapy (WHO 2020). One cause for the lack of support for patients is the *mental care gap*, which has worsened in recent years and crises, leaving mental health services depleted (Malhotra 2013). In Germany, the *mental care*

gap is particularly evident. Compared to 2021, the number of psychotherapists getting more than ten requests per week doubled, and only 10% of individuals demanding therapy could secure a treatment spot within one month. Almost 40% of people had to wait more than six months (Funke-Kaiser 2021). Rural regions face an even more significant deficit since the focus and concentration of services is higher in urban areas (Malhotra 2013). Particularly the Covid-19 pandemic has shed light on the mental health space, stressed-out healthcare staff, and the growing number of individuals impacted; hence new solutions are highly sought.

Another topic of interest, which is continually transforming our society, is digitization. The Covid-19 pandemic has contributed to the rapid growth of digital transformation, turning non-digital business processes and services into digital ones. Customer demand and the desire to keep up with the competition are two further causes. Overall, adopting digital transformation technology makes businesses more flexible in reacting to changing markets, promotes innovation, and strengthens their resilience. According to Statista, spending on digital transformation is expected to reach USD 1.6 billion by the end of 2022, rising to a projected USD 3.4 billion by 2026 (Statista 2022).

This progressive change has significantly impacted the health industry, particularly the mental health sector. The industry should satisfy client expectations as it moves toward digitalization in several areas. In the healthcare sector, more therapists use telemedicine to communicate with their patients and gather vital signs. To help affected individuals, the digital health industry has developed several alternative business models in recent years. Regulators and governments have recognized the problem and are opening the way for new business models (Wartenberg 2021). In Germany, for instance, the Federal Ministry of Health passed the Digital Health Care Act in 2019, setting a framework for digital health applications (DIGA's) that have been tested and shown to have a positive medical effect. Moreover, the law enables the prescription of such apps by doctors and psychotherapists, along with the

reimbursement of costs by health insurances (Bundesinstitut für Arzneimittel und Medizinprodukte 2022).

The analysis of a dynamic industry, where several companies with diverse business models are entering the market, is the major driving force behind our enthusiasm as students and authors of this paper. Moreover, the scarcity of literature analyzing digital mental health models supports the relevance of this research. Therefore, this empirical work examines the effectiveness of new and old therapeutical business models. The focus is on digital business models, based on cognitive behavioral therapy (CBT), treating mental illnesses such as depression and anxiety (IQWiG 2022). The geographical scope of this analysis is limited to Germany, allowing a detailed industry understanding. In the following thesis, the effectiveness, efficiency, benefits, and drawbacks of the new form of therapy and business model, as well as prospects, will be analyzed and elaborated.

2. Relevance and Focus of the Thesis

This section will discuss the work's relevance and focus, as well as the motivation for the chosen topic. The primary objective of this field report is to analyze business models in a selected industry (Digital Mental Health Therapy).

During early conversations about the industry selection, it became evident that all group members are interested in the healthcare industry, and some previously interacted professionally with it. During an internal discussion, the team discovered that digital mental health treatments are often grounded on CBT, which is especially well suited for the online format due to a high degree of structure as well as high self-management components. Depression and anxiety disorders, two of the most common mental health issues, are also best treated with this method (S. P. Chand, Kuckel, and Huecker 2022). As a result, the group opted to concentrate on the analysis of digital CBT (dCBT). Further, the group observed that mental

health concerns are becoming more prevalent in society and more people are open about mental well-being, especially the millennial generation. (Gishawn 2022).

Even though mental illnesses are prevalent in every nation worldwide, many governments and health systems fail to offer the treatment and support that their citizens need (World Health Organization 2022). As previously stated, Covid-19 significantly impacted the mental health industry and the outbreak of the Covid-19 pandemic in 2020 has not only threatened the mental health of millions of people but has also driven up short- and long-term total costs of mental care. These include, for example, lower productivity and other indirect costs to society, which often far exceed the cost of healthcare. In the first year of the pandemic, rates of mental illnesses such as depression and anxiety surged by more than 25% (250 million), on top of the approximately one billion individuals who already have a mental health issue. Consequently, the shortcomings of mental health services became increasingly apparent.

Due to the increasing number of patients affected, the treatment gap has widened, meaning that not all patients in need of therapy receive treatments instantly, as there is no balance between patients and therapists. According to the WHO, this necessitates an urgent shift to promote improved mental health for all (World Health Organization 2022). In consequence, it is critical that new, innovative solutions emerge as the market environment in today's world is constantly changing and placing new expectations on businesses and therapists. Above all, the importance of digitalization must be addressed. In recent years, digital transformation forced changes in various socioeconomic areas such as culture, education, and the economy (Luber and Litzel 2019). In a modern, patient-centered therapeutic practice, digitalization and its effective management should be unavoidable. Due to this shift, new business models for digital mental health therapy have evolved.

One country that has acknowledged this shift and made changes to the government and healthcare systems is Germany. According to the "D21 Digital Index" survey (2021), which

tracks the annual level of digitization in German society, digitization has been trending steadily upward in recent years (Initiative D21 e. V. 2021). Technological innovations have also been developed in the healthcare industry to reduce or improve the prevalence of mental illnesses in Germany. About 31% of Germans have at least one mental health condition, a similar share compared to other highly developed economies. As in most other affluent nations, depression and anxiety are the most prevalent mental health conditions among adults (McLean, 2021).

Although previous research in this field was conducted, not much light was shed on the specific analysis of business model components of digital mental health applications, as well as the business model's vulnerabilities and advantages. Instead, much research has focused on the medical effectiveness of digital treatment tools. The research found similar effectiveness of digital health interventions compared to face-to-face treatments, but positive medical outcomes would need to be further examined in long-term studies (Postel, de Haan, and de Jong 2008; Kambeitz-Ilankovic et al. 2022; Ebenfeld et al. 2014). Other authors examined components of telehealth business models but did not focus on specific digital therapeutical tools in Germany or examined the macro-effects of digital mental health applications during Covid-19 (Velayati et al. 2022; Mermelstein et al. 2017; Bunger et al. 2021). Therefore, to the best of our knowledge, this thesis deals with an unexplored topic and hence **adds value to the research by combining several research findings concerning the business model's components of digital mental health tools, the industry, and the evaluation of the effectiveness of digital therapeutic applications**. Moreover, technological advances, socio-economic changes, and disruptive business model innovations make it a uniquely exciting research topic.

3. Methodology (Justine Eling)

The following will outline the empirical approach underlying this analysis of business model variation in the mental health industry. Chapter 3.1 depicts which analytical frameworks were selected for the analysis of business models and why those were chosen over others. In the second part (3.2 Research Methods and Key Resources), the research method will be demonstrated. Finally, the approach to qualitative data generation will be explained.

3.1 Framework

In the following, the analytic frameworks for the analysis of business models will be introduced, and the selection of these analytic frameworks will be examined. Since many topics related to the study of business models remain the subject of academic debate and encompass multiple approaches and schools of thought, it is important to thoroughly examine the chosen approach to business model analysis. To ensure objectivity while selecting the framework for studying the business model and coming up with recommendations, we used several journals, papers, and books from various researchers and experts. A graphical demonstration of the process can be seen in Appendix 1.1.

Five key frameworks for evaluating and describing a business model were identified: *The Business Model Navigator Components of a Business Model* (Gassmann, Frankenberger, and Csik 2014), which is simple and straightforward, however, does not directly address the cost structure. *Components of a Business Model* (Amit and Zott 2012), which is also a well-structured framework, yet focuses on profit and does not include external factors. Moreover, *Reinventing Your Business Model* (Johnson, Christensen, and Kagermann 2008) misses out on including further stakeholders such as key partners. Finally, the *Simplified Business Model Canvas* (Afuah 2014) is not exhaustive enough compared to the original *Business Model Canvas* (Osterwalder and Pigneur 2010). Each component of the new business model will be

analyzed based on the *Business Model Canvas* by Osterwalder & Pigneur (2010). The analysis relies on this framework because it allows for the greatest depth of analysis and includes an internal and external perspective. According to the authors, a *"business model describes the rationale of how an organization creates, delivers, and captures value"* (p. 14). The *Business Model Canvas* inherits the nine building blocks of a successful business model, each described and applied to the digital CBT space.

To assess the business model, a detailed analysis of the strengths and weaknesses of internal capabilities, opportunities, and threats of the external environment was conducted. The ***SWOT Analysis*** frames these four perspectives on a business model into a strategic model. *SWOT Analysis* is a tool for strategic planning and management. It can be used to effectively build organizational and competitive strategies. The acronym SWOT stands for strengths, weaknesses, opportunities, and threats (Gürel 2017).

Our preliminary research indicated that the external environment has a significant impact on the companies, thus in addition to a thorough internal analysis, a structural approach is required to evaluate the external environment. Two frameworks are suitable for assessing the external environment: The *PESTEL analysis*, which describes macro-environmental factors, and Porter's five forces, which analyzes competitive structures. As competitive forces shape strategy, ***Porter's five forces*** framework was chosen. The framework is an effective way to evaluate competition and gain new perspectives on how mental health policy might be perceived and implemented in the field. (Velayati et al. 2022).

Based on the foregoing analysis, three recommendations were given on how to enhance service delivery and effectivity of the business model. To evaluate the effectiveness of these recommendations, we aimed to assess them based on the ***NUF Analysis*** framework, which considers the newness, usability, and feasibility of these recommendations. The three criteria are common themes throughout similar evaluation methods (Kudrowitz and Wallace 2013).

3.2 Research Methods & Key Resources

To give recommendations based on an in-depth analysis, this thesis is based on multiple and diverse sources of qualitative and quantitative research.

In the first step, a comprehensive **literature review** was conducted to thoroughly understand the industry and the variation of business models. This enabled familiarity with the chosen industry's current knowledge and the boundaries and limitations of that field (Newcomer, Hatry, and Wholey 2015). The academic sources of secondary research were comprised of relevant academic papers, journal articles, studies, and reports. In addition to the academic findings, the assessment of the industry's current state was mainly based on papers from influential public and private institutions (e.g., consulting firms and governmental organizations). The main goal of the literature research was to gain a comprehensive understanding of the industry and to make sure the results were thorough and objective.

In the second step, **five semi-structured interviews** with people suffering from mental illnesses, psychologists and industry and company experts were conducted. The interviews were based on a pre-defined interview guide, which formed the basis of the conversation and left room for additional situation-related questions. Semi-structured interviews incorporate the advantages of both structured and unstructured interviewing techniques. They provide a chance to address subjects that naturally occur or are essential to the interviewee while also enabling the objective comparison of interviewees (Longhurst 2009). The thirty-minute interviews were set up virtually to overcome physical barriers and enable timing flexibility. The experts were selected based on their credibility to give valuable insights into the mental health space and CBT business models or their experience with mental health issues. The Interviewees were selected either by contacting them through LinkedIn or by using the group members' personal network.

For our first interview, we decided to choose an expert of the mental health industry to fully understand the area's underlying forces, driving the evolution and growth of business models. Marie-Thérèse von Buttlar is part of the investment team of Earlybird Venture Capital and focuses on digital health topics along with education technology. Her experience as an investor makes her the perfect fit to understand the mental health industry, present opportunities, challenges, and success factors for the occurrence and growth of existing business models. Interviewing her was especially valuable in helping us to understand potential areas for business model enhancement.

In the second interview, we aimed for a deeper understanding of the strengths and weaknesses within a specific business model. Therefore, we decided to interview Daphne Petrich, Senior Business Development Manager at HelloBetter, a digital mental health company in the scope of our analysis.

The third interview was conducted with Dr. Detlev Schneider, a German psychotherapist with long-lasting industry experience to understand the applicability of digital CBT for the treatment of mental illnesses. It was considered of high importance to understand the opinion from a therapeutical viewpoint to assess the implications of shifting therapy to a digital setup.

In the final step, two anonymous interviews with patients with a history of mental illnesses were conducted. The objective of these interviews was to understand the patient experience with traditional CBT and in that context their positive as well as negative concerns. We aimed for a thorough understanding of different age groups, selecting two people diagnosed with depression at the ages of 26 and 68.

The combination of a literature review with five interviews allowed for a deep industry understanding and the incorporated business models, along with insights into therapeutical views, and the patients' experiences.

4. Evolution and Variation of Business Models in the Mental Healthcare Industry

Mental health is becoming increasingly crucial today since rapid societal development demands individuals to adapt to continually changing social, educational, and professional environments. This can evidently be seen in the rising use of mental care services as well as in work-related productivity losses (Robert Koch-Institut 2021). The importance of mental health is also reflected in increased media coverage and a greater emphasis on scientific and policy debates. The following chapter examines the evolution and origins of psychotherapy and related CBT, as well as the associated business model. The aim is to determine which advantages and weaknesses exist and may be addressed by new, innovative business models. Further, the evolution of the traditional business to digital mental therapeutical tools based on CBT will be described, as will the distinctions among the new digital business model. Since the study's geographic focus is Germany, this section concludes by describing the regulative framework in Germany, the DIGA regulations, and their benefits.

4.1 Traditional Business Model of Therapy

The traditional therapy session is guided by qualified psychotherapists, allowing people with behavioral disorders to receive the assistance they require. Psychotherapy seeks to resolve or lessen problematic behaviors, compulsions, beliefs, or emotions based on mental health issues, as well as enhance interpersonal relationships (American Psychiatric Association 2016). The business model consists of a therapeutic strategy, adapted to the individual patient. Cognitive behavioral therapy supports patients in identifying and changing thinking and behavior patterns which are harmful, by replacing them with functional behaviors. Rapid results are attainable with the patient's assistance, and the patient selects the number of sessions that are right for him or her, as well as whether to stop or restart therapy. CBT empowers patients to solve their problems on their own and places the therapist in an active observer position,

whilst developing a relationship. Thus, therapists can give situational advice in the traditional business model (Rist, Witthöft, and Bailer 2010). In our interview with a person experiencing depression, they rated the traditional neutral space as helpful. They also characterized their personal relationship with the therapist as comfortable and beneficial (see Appendix 2.4).

As already described, mental health issues have been rising in the last few years and are expected to grow even further, leading to many individuals seeking mental care. Every year, 27.8% of adults in Germany suffer from a mental illness, corresponding to an absolute number of 17.8 million individuals (Deutsche Gesellschaft für Psychiatrie und Psychotherapie 2022). Whereas the demand is growing, the supply and availability of mental care do not grow in line. The number of specialists in psychiatry and psychotherapy was 14.300 in Germany in 2022 (Ibid.). Using these figures, one psychotherapist would have to treat 1245 adult patients who require mental health care. When including minors (people under 18 years old) requiring mental health care, the ratio is considerably worse. The *mental care gap* between the demand for mental care and its supply displays a system-level problem that traditional CBT cannot solve due to the low scalability to treat patients at the current population level (Wilhelm et al. 2020).

With a study in 1975 and its continuation in further years, the burden on those affected was presented for the first time in Germany. As a result, the phrases mental disorder and mental illness have gradually supplanted the earlier terms mental sickness and mental disease. It is regarded as more impartial and less stigmatizing, mainly because it does not entail preconceptions about the reasons, which are frequently not scientifically verified (Robert Koch-Institut 2021). Historically, Philippe Pinel (1745-1826), a French physician, is regarded as the pioneer of psychiatry since he was the first physician who recommended civilized therapy for people suffering from mental disorders (Laios, Michaleas, and Karamanou 2020). However, modern psychotherapy did not exist until the work of Sigmund Freud (1856-1936), which led to the establishment of CBT in the 1960s by Aaron Beck, who saw depression as a mental

illness rather than a mood disorder. Beck developed CBT and it is now the most researched psychotherapy with the most evidence-based treatments and has thus been shown in many studies to be effective in curing some psychiatric disorders, including depression and anxiety disorders (S. Chand, Kuckel, and Huecker 2022). Today the traditional business model is reliant on several stakeholders, which are briefly explained in the following:

a) **Government:**

For the German market, there are different authorities for psychology and its profession. Comprehensive government support systems and a high degree of dedication to those with mental illness are present in Germany. The government is working with some therapists to draft new policies to de-stigmatizing mental illness in German culture and helping those suffering (BMZ 2022). Another important consideration controlled by the government, particularly by the Federal Committee of Doctors and Health Insurers, and which has a significant impact on how psychotherapy is practiced in Germany is the creation and compliance with certain laws and standards. This also covers the legislation that regulates the practice of psychotherapy, which directly affects the psychotherapy agreements and guidelines (Kassenärztliche Bundesvereiningung 2022). For instance, to practice their profession, psychotherapists must undergo a lengthy and demanding professional training program. Moreover, recent legislation, like the DIGA Regulation (see chapter 4.3), has opened the door for innovative thinking to emerge and eventually transform the German healthcare system.

b) **Insurances:**

Public health insurers cover the entire cost of psychotherapy when a significant mental illness or problem is present. This allows more individuals to receive the care they require. Another important factor is that a lot of psychotherapists take clients straight from insurance providers,

which builds up their clientele (Barmer Internetredaktion 2022). However, therapists' methods vary depending on whether the patient is privately or publicly insured. Private practices are permitted to select their own patients, and they only accept self-paying clients, meaning that the cost of the therapy is not covered by public health insurances. In Germany, a “fee schedule” for psychotherapists determines the hourly amount that can be billed by both a private and public practice. According to the charge schedule, a traditional 50-minute behavioral therapy session costs EUR 100.55 (see BPtK, 2020, number 870 with the customary 2.3-foldrise rate). There can be fees for the patient, depending on the provider they choose. If the patient chooses a public practice, their costs are covered by the health insurance, but this tends to be difficult and lengthy due to the long waiting times. However, if the patient selects a private practice and is publicly insured, the patient will be responsible for all service charges.

The lack of psychotherapists and therefore therapy slots in practices is a significant issue. According to the German Federal Chamber of Psychotherapists examination from 2019, more than 300,000 insured persons, approximately 40% of patients, diagnosed with mental illnesses, wait at least three to nine months to begin therapy wFunke-Kaiser 2021).

c) **Psychotherapists & General Practitioners:**

Other crucial stakeholders for the traditional business model are psychotherapists and general practitioners (GP’s). To have access to mental treatment options, such as cognitive behavioral therapy, and treatment sessions to be reimbursed by insurances, patients require a referral by psychotherapists or GP’s who must prescribe the mental health treatment (Bundespsychotherapeutenkammer 2019). Moreover, psychotherapists are responsible for the execution of the therapy sessions. The scarcity of psychotherapists, as well as the lengthy waiting periods for persons seeking mental health care, might damage patients' mental health. (Funke-Kaiser 2021).

To point out the traditional business model's advantages and disadvantages, an overview can be seen in the following Table 1.

Advantages	Weaknesses
Easy-to-read gestures, and facial, and body expressions due to Face-to-face therapy	Low availability of therapy spots, leading to long waiting-times and eventually high costs if not (fully-) reimbursed by insurances
Establishment of a personal relationship between patient and psychotherapist	Risk of stigmatization by physically entering a practice (e.g., in rural areas)
Established treatment method with long-term evidence of positive medical outcome	High time-effort due to the need to visit the psychotherapists' practice

Table 1: Advantages and Weaknesses of the traditional CBT BM (own illustration)

4.2 The digital Mental Health Industry and the Evolution of the new Business Model of dCBT

As stated above, the traditional Business Model of CBT is one of the most researched and successful therapy methods and therefore perceived as the gold-standard therapy (Kambeitz-Ilankovic et al. 2022). The mental health industry evolved significantly in the last decade. On the one hand, increasing factors such as the pandemic, poverty, and demographic changes, led to an increase of 13% in mental health issues globally (World Health Organization 2022a). On the other hand, the lack of resources allocated to the mental health industry by governments creates a lack of accessibility to mental care for individuals – the *mental care gap*. As described in a report by the World Economic Forum, this gap is not only formed by the low availability to access desired treatments but also by the lack of access to affordable and effective treatment methods (World Economic Forum, 2021). The combination of the desire for better mental health access and disruptive technologies allowed the mental health care industry to rethink concepts and develop new, diverse business models dealing with various mental health issues. Technologies enabling such development are internet and internet-compatible end devices that

allow patients to self-guide their mental health and wellness. According to the World Economic Forum, disruptive technologies in the mental health industry "refer to innovative technology-based solutions that significantly change the way societies prevent, identify, diagnose, treat and support mental health and wellness" (World Economic Forum, 2021, p. 12). Such technology-driven business models, changing the traditional way of doing business, are incorporated in the digital mental health industry.

In this new industry limb, business models vary by **target group,** such as business-to-business (B2B), business-to-consumer (B2C), or business-to-business-to-consumer (B2B2C) (see Figure 1). Moreover, the business models vary by **value proposition**. Whereas B2B models focus on delivering value for psychologists through online courses and therapy planning and practice software, like Elona Health, B2B2C models deal with the mental well-being of a company's employees, such as Nilo Health (Elona Health 2022; Nilo Health 2022).Usually, in this concept, the company pays a fee for its workforce (either per employee or per bundle of employees), with a budget available to access virtual consultation sessions with a psychologist, self-guided meditations or exercises, and roundtables. B2C directly targets and accesses the individual by offering the patient self-guided, digital treatments and well-being methods. The treatments in the B2C space can be divided into three separate areas:

1) **Preventive tools** for consumers with an awareness of mental wellness, giving them access to, e.g., guided meditation exercises, such as Meditopia (2022). Those tools focus on limiting the progression of mental health problems such as anxiety and depression to more acute conditions (Big Society Capital 2020).

2) **Diagnosis and monitoring tools** that assess, for example, if a mental disorder is in place or helps the patient to track their symptoms' occurrence (Bucci, Schwannauer, and Berry 2019). For example, such value is proposed by Bearable (2022).

3) **Therapeutic tools** based on the concept of cognitive behavior therapy. By making CBT digitally accessible, these mental health tools are understood as a reactive self-guided therapy for mental disorders , also known as dCBT (Stern et al. 2022). Those interactive websites or Apps can be prescribed by a GP's or psychotherapists and are either used under supervision of a therapeutical instructor or are used in conjunction with a traditional therapy. The extent of direct interaction with a psychotherapist varies by business model provider. Nevertheless, the treatment sessions provided in such business models are always self-guided and support the client in dealing with his mental health issue. These business models focus on mental issues such as depression, anxiety, agoraphobia, panic attacks, and sleep disorders among others.

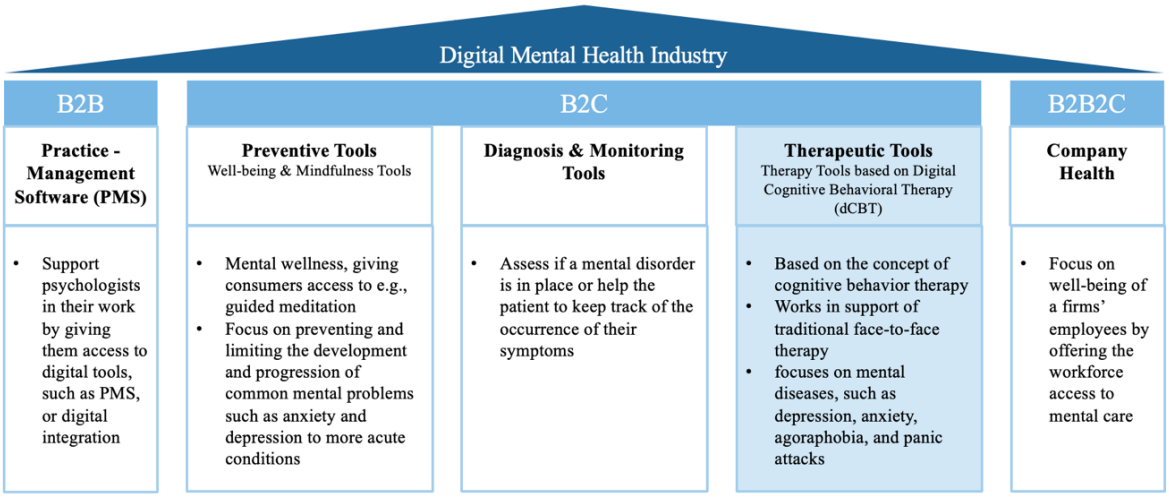


Figure 1: Overview of the digital mental health industry (own illustration)

Due to the broadness of available business models in the mental health industry, our thesis **focuses on therapeutical tools** that offer digital cognitive behavioral therapy. Because the **dCBT business models** are best compared to the traditional business model of CBT, a thorough analysis and comparison between the conventional and new business models will be pursued. In 2019, Germany issued new regulations for the financial reimbursed of the services provided

by digital therapeutical business models. In order to get the costs for the dCBT model reimbursed, service providers must comply with certain regulatory standards. The new regulations can drive a business models' success and are therefore crucial to comply with for business models in this space. Therefore, the regulatory framework will be described in the following chapter.

4.3 Regulatory Framework: DIGA

The reimbursement of digital therapeutical business models is a critical success factor compared to the traditional business model. In 2019, the German ministry *Federal Institute for Drugs and Medical Devices* (BfArM) issued the *Digital Healthcare Act* that allows health applications on prescription by physicians and psychotherapists, and their reimbursement by statutory health insurance (BfArM 2020). To offer a therapeutical service that is reimbursed, the tool must be accepted as a digital health application, called DIGA in this context. According to the regulations, a DIGA can be understood as a medical device that's main function is based on digital technologies and "supports the recognition, monitoring, treatment or alleviation of diseases or the recognition, treatment or alleviation or compensation of injuries or disabilities" (BfArM, 2020, p. 12). As long as the main function of the tool is digital, hardware and personal services can also be implemented. Services, such as consultation, must be understood as an add-on availability to the digital tool. The DIGA incorporates different categories of digital health tools, for example, tools that tackle the nervous system, hormones, the cardiovascular or respiratory human cycle, or cancer. One category, our focus, is digital applications dealing with the psych.

An illustrative example of such a digital therapeutic service is described as an app that:

> *"Provides a digitally designed healthcare model for patients with mild depressive episodes that gives information about the disease, records, and documents moods, registers symptoms, supports the preparation of individual content such as diaries, gives guidance for relaxation or similar exercises, and enables contact with a chatbot. If necessary, for example, if a severe depressive episode might be coming, the treating physician or psychotherapist is automatically contacted and is prompted to establish contact"* (BfArM, 2020, p. 17).

DIGA's are digital assistants in the hand of patients. They can be accepted either on the provision or as a final listing in the DIGA directory. Among many specific criteria, such as data protection, information security, and technological properties, business models applying for the DIGA must provide a clinical study **proving the positive healthcare effect of their tool**. The study and its outcomes must be conducted and presented to the BfArM by a manufacturer-independent scientific institution (BfArM 2020). The progress of the medical study and its effect decides whether a service provider is accepted on provision or finally. When the study is finished and shows the desired positive results, a final listing is possible. The detailed application process for a DIGA, as well as the relationship between involved stakeholders can be seen in the Appendix (see Appendix 1.2 and 1.3). The proof of a positive medical effect and hence the acceptance of a business model as a DIGA is crucial for therapeutical business models to compare with the traditional therapy model. Prices for each DIGA application are defined by the company or startup offering the service itself in the first year of acceptance and afterwards need to be negotiated with the public insurance via a mediator to get reimbursed (Die Techniker Krankenkasse 2022). Since insurers value the price for the therapeutic service not as high as the provider itself, prices after negotiations often differ substantially (see chapter 5.9).

Currently, ten business models in the mental health space are accepted by the DIGA either on provisional or final listing. The following Table 2 depicts each DIGA-accepted company, along with the type of regulatory approval.

Company	Tool and Therapy Description	Type of DIGA Approval
Deprexis	Interactive online-based self-help program for therapy support of patients with depression and depressive moods	Final listing
HelloBetter	Online- and App-based therapy for preventing and treating stress and burnout, panic, chronical pain, depression	Provisionally accepted and final listing
Invirto	Digital therapy via an app and virtual reality glasses (VR) to treat agoraphobia, panic disorder, social phobia and anxiety	Provisionally accepted
Mindable	Interactive online-based treatment program against agoraphobia and panic, by delivering psychoeducation, habituation to body symptoms as well as in vivo confrontation	Provisionally accepted
Novego	Online program to accompany therapy against depression and stress	Provisionally accepted
Selfapy	Online- and App-based therapy for depression, anxiety, and panic disorders	Provisionally accepted and final listing
Somnio	Digital application for the treatment of sleep onset and sleep maintenance disorders (insomnia)	Final listing
Velibra	Web-based program for patients with anxiety disorder, panic disorder with or without agoraphobia, or social anxiety disorder	Final listing
Vorvida	Support therapy in managing harming alcohol consumption or alcohol dependence	Final listing
Nichtraucher Helden	Treatment and relief of diagnosed tobacco dependence	Provisionally accepted

Table 2: Overview of DIGA approved mental therapeutical tools (own illustration)

To further understand such components as prices and revenue, a thorough analysis of the digital CBT model will be conducted in the following.

5. Analysis of the dCBT Business Model according to the Business Model Canvas by Osterwalder & Pigneur (2010)

As described in chapter 3, the Business Model Canvas based on Osterwalder and Pigneur (2010) was chosen to understand and describe the digital CBT business model. Digital psychotherapy can be defined as the delivery of a psychotherapeutic treatment in the digital space through a

website or smartphone application. Digital psychotherapy specifically aims to replicate the information exchanged with a therapist during traditional therapy. The fundamental components of traditional CBT are replicated in the supporting modules, including recording thoughts and behaviors, encouraging behavioral solutions, addressing bad habits, delivering awareness training, and closing with relapse prevention techniques. The majority of online courses adapt the therapy content based on the responses the user enters (Weightman 2020). In the following, this business model will be analyzed in detail based on the nine building blocks in the business model canvas: value proposition, key partners, customer segments, customer relationships, key activities, key resources, channels, revenue streams, and cost structure (Osterwalder and Pigneur 2010).

5.1 Value Proposition

According to Osterwalder & Pigneur, one primary building block of a business model is the value proposition. It describes, *"why customers turn to one company over another"* (Osterwalder & Pigneur 2010, p. 18). The value proposition answers the questions of what value is delivered to the customer and what customer problems the business model solves. In the case of digital therapeutic tools, value propositions are not only offered to the customer but also other involved stakeholders in the business model. Due to regulations, as well as the foundation of the new business model on the traditional form of CBT, not only customers but also psychotherapists and insurers can profit from the new business model value propositions. Engaging all stakeholders in the business model and targeting them through unique value propositions, specifically in comparison to the traditional business model, is crucial for the success of digital therapeutic tools. The value propositions for the customers (patients), psychotherapists, as well as insurers will be analyzed in the following.

5.1.1 Value Proposition for Customers

Digital CBT models solve problems customers face in the form of traditional CBT therapy (Dent et al. 2018) – availability, access, flexibility, and convenience of therapy, lower stigmatization, along with the added value of mass personalization. Digital CBT models seek to decrease the number of human professionals involved through either offering fully digital approaches by deploying technology such as AI and augmenting the role of human interaction or by offering platforms with self-guided exercises. Although the systems within digital CBT might differ slightly by the type of technology and involvement of therapists in the care-delivery process, the tools work within a digital platform providing the service and offer the same following value propositions for clients:

Availability. Digital CBT tools minimize the problem of low therapist availability by offering new digital therapy platforms, thereby increasing access to mental health care. Digital CBT tools are available to anyone with an internet connection and a suitable device. Clients can access the tools via Web or App and get guided through several exercises, informative courses, and therapy sessions. Due to the digital CBT business model's scalability, more clients can access mental care.

Access, Flexibility & Convenience. Besides the increasing availability of mental care services, dCBT tools tackle patient-level barriers of access to mental care services. Patients using traditional CBT reported that *"logistical barriers, including a lack of transportation to attend appointments, an inability to take time off from work to attend meetings, and/or a lack of childcare"* are obstacles to receiving mental health care (Wilhelm et al. 2020, p.2). With the digital business model of CBT, the **traditional barriers of time, location, and access are removed** (World Economic Forum 2021). As our interview partner, Marie-Therese von Buttlar put it: *"you don't have the physical barrier,"* meaning that *"you don't have to go there and integrate it into everyday life, but we can do it more flexibly from home"*(see Appendix 2.1).

Moreover, another interview partner, suffering from depression, validated that assumption: *"if you can receive access to therapy faster this would be a major advantage"* (see Appendix 2.5).

Since the digital business model is primarily available via a computer, tablet, smartphone, or laptop, customers do not face any time constraints and instead have flexible access to the tool whenever needed, providing immediate treatment for acute situations (Wilhelm et al. 2020). The German startup HelloBetter, for example, offers online exercises, videos, and audio for patients to deal with their depression, burnout, or panic disorders at their own pace, available at the patient's convenience. Additionally, digital interventions save time because patients do not need to commute to a local therapist or deal with office hours (Wilhelm et al. 2020). Since a local therapist is not always nearby, self-therapeutic, digital interventions promote equitable access to mental care in rural areas. It also creates availability of services for patients suffering from immobility due to the removal of physical constraints, e.g., digital CBT enables Covid 19 compliance (Kambeitz-Ilankovic et al. 2022). Although those benefits seem prevalent, obstacles due to patients' inability to use the technical device properly, as well as the lack of closeness with the patient, must be noted as challenges of digital mental care (For further challenges, see chapter 6.2) (Guinart et al. 2021).

Stigma. Digital CBT tools offer an additional advantage, which is the reduction of exposition to stigmatization and discrimination for clients compared to walking into a psychotherapist's office (Kasckow et al. 2014). Although treating mental illnesses is more accepted nowadays, the fear of stigmatization is still highly prevalent and may prevent individuals from seeking mental care and sharing their personal problems. People with major mental illnesses may feel ashamed, unsure, or alone when they visit a psychotherapist's office due to their symptoms or illness diagnosis. Due to worries about what other people will say or think and the possibility of rejection as a result of their disease, these people may be afraid to reach out to others (J. A. Naslund et al. 2016). According to the World Economic Forum, digital

tools can reduce such barriers and encourage *"people to start their mental health journey earlier"* (World Economic Forum, 2021 p.15). The reduction in stigmatization was also validated in one of our expert interviews with Marie-Therese von Buttlar as she stated that *“for many people it is simply a big effort to really go somewhere in person, because it is stigmatized“* (see Appendix 2.1). Furthermore, both participants suffering from depression requested anonymity, indicating that the topic has not yet been sufficiently de-stigmatized.

Mass Personalization. Besides the named value propositions for clients, mass personalization is another factor to consider as a value add. With more data available, exercises, therapy sessions, audio, and lectures can be adjusted to the client's needs and scaled based on the underlying mental illness. This allows for *"offering the right treatment for the right person at the right time, improving the focus of service delivery and outcomes"* (World Economic Forum 2021, p. 16). For example, the company HelloBetter offers online courses tailored to a) stress & burnout, b) panic, and c) diabetes and depression. Clients undergoing the panic treatment method receive psychoeducation about panic, fill in daily diaries summarizing their moods and attacks, and are encouraged to engage in respiratory exercises that calm them down. Psychologists track, evaluate, and comment on clients' progress via direct messaging (Ebenfeld et al. 2014). Clients suffering from diagnosed panic attacks can profit from those very explicitly tailored treatments, leading to a better experience and outcome compared to traditional CBT (Allen et al. 2016). Moreover, another company, Invirto, offers guided lectures and therapy sessions with a psychologist through Virtual Reality (VR) to tackle panic disorders and agoraphobia. By providing the trifecta of a digital platform, VR, and a human psychologist, Invirto has greater interactivity and, therefore more customization options, allowing for an individual tailored therapy methodology. (Invirto 2022b).

5.1.2 Value Proposition for Psychotherapists

As previously described, digital mental care tools can work as complete online tools, where clients have no human interaction, or as a hybrid version, where a therapist or psychologist supervises or guides the patient through each stage or is connected with a patient to conduct digitally mediated therapy sessions. In the latter case, the business model offers a value proposition not solely to the clients receiving the treatment but also to mental care professionals. The value proposition is three-fold and crucial to onboard, convince and retain psychologists to the new business model, since a psychotherapist must prescribe therapeutic tools. Prescribing and engaging in the digital therapeutic business model offers the following value propositions to therapists:

Optimized scheduling & flexibility. With traditional CBT, mental care professionals schedule an appointment with the patient and rely on their show-up on time**.** Due to several factors, such as traffic or time management, clients can come late to their appointment, disturbing the timetable of the psychologist. One of the value-adds originating from the digital CBT model is that mental care providers can rely on the scheduling with clients and the timely appointment start because disruptive external factors are minimized. Moreover, a reduction in no-shows and easier rearrangements are advantages of telepsychiatry (Guinart et al. 2021). Table 3 below provides a summary of the key advantages of telepsychiatry as seen by healthcare professionals.

Advantages	% of Responders who endorsed
Flexible scheduling or rescheduling	77%
Timely start (no commute or intake delays)	69%
Lack or reduction of no-shows	52%
Patient seemed more engaged and comfortable	41%

Table 3: Perceived advantages of Telepsychiatry by healthcare providers, after Guinart et al. (2021)

Training. Another value proposition posed by some startups operating in the space is that psychologists and therapists, either working at one of the companies or prescribing the treatment, have access to further education and training provided by the companies. For example, the startup HelloBetter offers CME-certified (Continuing Medical Education) online education about new therapy methods and the possibility to converse with experts in the space.

Onboarding of existing clients & access to a new client base. The third advantage for psychologists using digital CBT Tools is that they can offer, hence prescribe, those platforms and apps as additional services to their ongoing traditional in-person therapy. Using such tools, long waiting times until the following physical therapy session, where the patient cannot access mental care, can be bridged. Additionally, exercises, homework, and diaries can be more easily bundled, tracked, and analyzed. A startup offering such a way of integration is Mindable Health (2022), tackling panic disorders and agoraphobia. In line with that, Selfapy (2022), a company tackling patients' depression, can also be used in conjunction with existing therapy and can help the psychologist guide the patient after the treatment to prevent relapse.

5.1.3 Value Proposition for Insurers

In the digital mental health business model, insurers play a crucial role. With their onboarding, the offered services to patients can be reimbursed to the client, paid by the insurance. Two main value propositions are offered to insurers to convince them of the value added by the new business model compared to the traditional CBT.

Innovativeness & Preventive care. With the pressing issue of mental health problems, digital CBT models offer an alternative approach to face-to-face therapy. Supporting such innovative methods, the effect spills over to insurances supporting those new developments. Moreover, with digital treatments, insurances can offer a better care experience to their insured since clients can directly start treating their mental issues. By giving their customers early

access to mental health care, clients can profit from an overall better health, and insurers can prevent severe mental issues, otherwise leading to higher costs to be reimbursed by the insurance. This allows for early preventive treatments and better care, cutting follow-on costs for the insurer (Invirto 2022a).

Cost reduction. Hand in hand with the argument of better care comes the added value of cost reduction. Treating mental diseases early on can prevent severe interventions, saving the insurer costs. Moreover, as stated above, digital therapeutic tools can be seen as more cost-effective than traditional face-to-face CBT since costs per session are lower. According to Guaiana et al. (2021), telepsychiatry services can be more cost-effective than in-person care or at least do not cost more than traditional in-person care. For example, the startup HelloBetter offers a 12-week panic disorder and chronic pain course with one-time charges of EUR 599 (Bundesinstitut für Arzneimittel und Medizinprodukte 2022b). With 45–60-minute sessions per week, this amounts to around EUR 99 per session, with six online sessions included in the package, constantly available for the patient's convenience. Novego, another digital CBT startup dealing with depressive illnesses, provides online courses for depression in conjunction with psychologists' supervision in the case of questions or acute crises. The startup offers their course for EUR 249 and a duration of 12 weeks with 45–60-minute sessions per week (Bundesinstitut für Arzneimittel und Medizinprodukte 2022c). The costs for Novego's service amount to around EUR 21 per session. Comparing those costs with the charge schedule for psychotherapists issued by the BPtK (2020), where a typical 50-minute CBT session will cost exactly EUR 100.55, it can be shown that the costs for digital interventions are lower than those for traditional CBT.

5.2 Key Partners

The business model canvas describes the segment of key partners as *"the network of suppliers and partners that make the business model work"* (Osterwalder & Pigneur 2010). Key partners should be chosen from a long-term perspective to guarantee the company's ongoing success. Our group identified several key stakeholders a firm should include and manage. They are presented in the following.

Psychologists or Therapists. Due to the digital, hybrid cognitive behavioral therapy concept, the business model serves as a therapy provider to patients. Besides the online platform provided in the business model, hybrid digital firms offer personal assistance and/or supervision by a therapist or psychologist. To guarantee consultations with the relevant expertise, applied to a specific mental health issue, psychologists and therapists are of high relevance to firms operating in the digital hybrid CBT space (Stern et al. 2022). Mental care workers recommend and precribe the solution for the end-user. Attracting and acquiring such personnel is crucial to, on the one hand, attract customers and, on the other hand, offer the promised benefits to the customer. The high relevance of psychotherapists was also proven in our interview with Marie-Therese von Buttlar stating that in DIGA-approved business models, *"doctors have to prescribe the DIGA"* and *"it's really difficult"* to get doctors to do so (see Appendix 2.1). The business model must be prescribed by a psychologist, therapist, or general practitioner to get reimbursed by public or private insurance. The possibility of reimbursing the costs depends on the acceptance of the platform by the DIGA. A therapist prescribes the digital mental care course content of the company HelloBetter, for example, and the patient submits the prescription to their insurance. After the commitment by the insurer, the patient receives a code that allows access to the digital platform. Therefore, the key partners for digital CBT business models are medical experts convinced of digital therapy's success.

Universities. Hand in hand with the onboarding of medical experts, the partnership with universities is crucial. Universities can support the operating firms in conducting academic studies regarding the success rate of the offered digital therapeutic tool. In Germany, the Federal Institute for Drugs and Medical Devices (BFARM), issues a license for digital health apps after they proved their concept in academic studies – the DIGA (see chapter 4.3). Therefore, cooperation with at least one university is of high interest to reduce customers' uncertainty about the platform's success, as well as for a license to operate - for example, HelloBetter partners with the technical university of Munich and the Vrije Universitet Amsterdam.

Software Companies. A partnership with an appropriate software company is vital to providing a digital mental care tool. All business models in the digital CBT space need to establish a web- or app-based platform, including a user interface that can react to the patient's progress. Therefore, a partner developing a logarithm, software, and interface is needed to operate effectively. Moreover, for some companies, such as Invirto, a partnership with a technology hardware provider is required to make their service accessible. Clients can attend their therapy sessions using VR according to their business model. The VR glasses and headphones are sent to the client via post mail. To operate most efficiently, a partnership with a VR and headphone provider seems useful (Invirto 2022).

Government. Another critical partner identified in our analysis is the German government. The digital healthcare act from 2019 enables the fast development and adoption of digital healthcare solutions in the healthcare industry (BfArM 2022a). The Federal Institute for Drugs and Medical Devices (BFARM) sets the regulative framework, such as data security-functionality -, and quality standards for integrating web- and app-based tools in the healthcare system. The institution also issues the DIGA certificate. Governments, therefore, incentivize and regulate the cooperation between insurers and business model providers, displaying a significant role in the business models' success. After regulations are met, the clients' fees in

the business model can be reimbursed by public and private insurances – crucial for the adoption of the digital business model.

Insurers. As mentioned, partnerships with insurers are essential for the digital business model. The collaboration between business model providers and insurances allows for the reimbursement of the treatment on the one hand while improving customer care and generating cost-savings for insurances on the other hand. The cooperation is a win-win situation for both partners. For example, in one of our expert interviews, we found that the startup HelloBetter works closely with one of Germany's largest insurers, Barmer. According to our interview partner and employee at HelloBetter, Daphne Petrich, the partnership with Barmer was one of their first partnerships, and *"they (Barmer) are probably the reason we stayed afloat the first like three years" (Interview 2).* According to her, this is because they could rely on contracts with the insurance, that advertised some mental care treatments, such as for depression, to their customers (BARMER 2022). This can help dCBT business model providers to enlarge their customer base more efficiently, as well as profit from publicity and know-how.

5.3 Customer Segments

Customer segments can be described as *"the different groups of people or organizations an enterprise aims to reach and serve"* (Osterwalder & Pigneur 2010, p.20). This allows better understanding for whom the business model is generating value and who their customers are. Different clusters can be analyzed based on criteria that the customer segments share or that differentiate them. Such clusters can, for example, illustrate that a business model targets the mass market, a niche market, or a clustered customer segment.

In the case of digital therapeutic tools, we found that business models are creating value for a niche market. This means that companies in the digital mental care space cater to specific customer clusters, and each building block of the business model is tailored to the customers'

particular needs, shaped by each mental illness. Since digital therapeutic tools are tailored to individuals suffering from mental health issues and seeking mental care, business models target a specific customer group and not the broad mass market (which would be the case for mental wellness tools). Each business model's customer segment depends on the mental health issue the company is tackling. For example, HelloBetter has different online courses available for depression or panic disorders, with each of those courses targeting another customer segment. Other companies, such as Invirto and Mindable health, are tackling agoraphobia, targeting people who suffer from panic disorders. And the German startup Selfapy is offering its value proposition specifically to customers with mild depression.

Although the customer segments may vary by each company and business model, the customers across all companies have attributes in common. According to the Federal Institute for Drugs and Medical Devices (BFARM) that issues the DIGA license, the named companies are all tackling mental diseases such as depression, panic disorders, agoraphobia, anxiety, sleep disorders, and addictive behavior. Moreover, since we are analyzing business models in Germany, we found that the companies address clients in either Germany or Europe. Additionally, they are tailored to adult customers between 18 and 65+ years old. Some courses are tailored to people only between 18 and 65 years old, such as the stress and burnout online course by HelloBetter (BfArM and HelloBetter 2022). The age group was also validated in one of our expert interviews with Marie-Therese von Buttlar. Moreover, our other expert interview partner, Daphne Petrich from HelloBetter, analyzed that at her company, *"most of the people using"* (their services) *"were women in their forties or fifties"* (see Appendix 2.2). Additionally, it was stated that digital therapy is tailored to digital affine people with no severe mental issues. The courses are rather seen as an additional accompaniment to traditional CBT than a complete replacement. Besides the criteria describing the customers targeted, we also found aspects that lead to the exclusion of the customer segment addressed by the digital

therapeutic business models. For example, most business models exclude customers suffering from severe suicidal thoughts, schizophrenia, or substance abuse and dependency.

5.4 Customer Relationship

The customer relationship describes how a firm gets in touch with its customers and relationship it wants to establish with them (Osterwalder and Pigneur 2010). Customer relationships contribute to the development of customer trust and brand reputation. This increases the customer's lifetime value by balancing the fact that obtaining new customers is far more expensive than keeping the ones you already have. Customers' acquisition, retention, and sales growth are its three strategic drivers. There is a whole spectrum of customer relationships, ranging from highly impersonal to close, personal interactions, or from low-touch to high-touch relationships as can be seen in Figure 2.

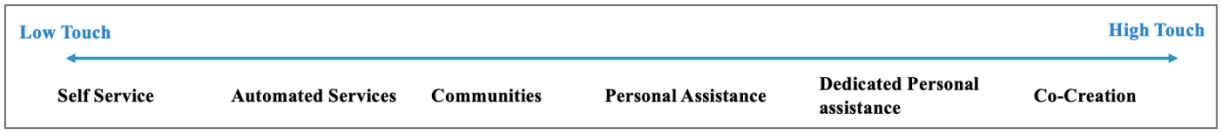


Figure 2: Levels of customer relationship (Osterwalder & Pigneur 2010)

Digital CBT business models cover a spectrum of customer relationship types:

a) **Automated services:** The interaction is low, yet automated personalization based on the mental illness, customer desire, prescription, and other information is provided. Customers may receive personalized information and options through customized processes. Automated services are at the core relationship of digital CBT. The format of automated services varies depending on the business model. The services are automated to the extent that a customer receives an online service offering standardized for the type of mental illness and the type of treatment. Online courses based on the type of mental illness are one example, or therapy complementing app features. Businesses such as HelloBetter, provide courses specifically tailored to the customer’s needs based

on the type of mental illness. For instance, the firm provides a course specifically tailored to depression (HelloBetter 2019). Another example is Invitro, which provides complementary offerings in an app to enhance therapy by leveraging AI technologies. Likewise, the technology and program the customer receives are standardized (Invirto 2022). The main advantage of providing these automated services are economies of scale, meaning that the variable costs per unit are decreasing significantly with additional customers. The costs of developing and facilitating this service are independent of the size of the customer base. In result, this enables a higher profitability of the business model.

b) **Dedicated personal assistance:** Describes when a representative is assigned to specific customers. Businesses use personal interaction to create deeper connections and build trust. Patients are accompanied and supervised by a psychotherapist through their treatment, getting feedback and allowing direct questions to a professional. Two forms of dedicated personal assistance can be seen in the analyzed companies. Some companies offer highly personalized care and others provide personal assistance. Exemplified with the business model of Invirto: The company offers online lessons, VR-based therapeutical measures, and personal therapy sessions with a directed therapist. This therapist is also in charge of the whole therapy of the patient (Invirto 2022). In that case, the relationship between the psychotherapist and retention of the customer is increased, due to the creation of a therapist-patient relationship. In contrast, HelloBetter only offers supportive personal assistance, and focuses on providing automated services. Customers can get in personal contact with a therapist in case of demanding it for example in case of suicidal thoughts. The customer can get in touch with employees only via text message or (video) calls.

In conclusion, automated services and dedicated personal assistance are two forms of customer relationships that can be observed in existing business models. However, there is some room for business model enhancement. For example, communities might be one enabler of customer retention due to increased customer loyalty.

5.5 Key Resources

Key resources can be understood as the resources an enterprise or business model needs to fulfill its value proposition, earn revenues, and maintain its customer relationship (Osterwalder and Pigneur 2010). Key resources are categorized as intellectual, human, financial and physical. Following Osterwalder & Pigneur (2010), *"different key resources are needed depending on the type of business model"* (p. 34). In the case of the digital CBT business model, our group identified three relevant resources.

The most critical resources for the business model's success are **intellectual property and human resources.** To facilitate efficient CBT via digital tools, the methods and content of the therapy program must be evidence-based. The intellectual property and the human resources of therapists are essential. Therefore, hiring therapists or psychologists is, on the one hand, relevant for developing a personalized treatment plan for the consumer/patient and being available for specific patient consultation requests. Furthermore, building an online mental health platform with various complex features such as text and audio lectures, interactive exercises, and video consultations require knowledge of software engineering. This knowledge can be produced in-house by hiring suitable software developers or leased or acquired from outside. Since hiring software developers as full-time employees is very costly, acquiring the platform's development from service companies seems suitable for early-stage startups. Besides the knowledge of software developers, expertise in psychology and therapy is needed to build an effective treatment program that helps patients.

Next to those resources, **available capital** is also significant to the business model. The digital CBT market is still relatively young, and most businesses are in the early-stage or growth phase. Investments in research and development and people, along with high customer acquisition costs, lead to high cash-burn rates, needing dCBT startups to search for funding from Venture Capital's and Business Angels. Especially due to marketing expenses, startups are burning cash for a long time before getting profitable. Providers can make use of the economies of scale of the business model, decreasing costs per unit, the more customers are onboarded. Nevertheless, to get there, funding is required. For instance, Hellobetter just raised their EUR 6 million Series A from Mass Mututal Ventures and Invirto, incorporated in the firm Sympatient, acquired EUR 7.5 million from Verve Ventures (Verve Ventures 2022; Paul 2022). The money allows the firms to expand in other regions (such as Hellobetter into USA) and acquire more customers. VC's expect high returns after exiting the company, hoping to make use of the disruptive changes and high growth in the market.

5.6 Key Activities

The following key activities need to be performed by a business to operate successfully. They are required to create and offer a value proposition, access markets, preserve client relationships, and generate income (Osterwalder and Pigneur 2010).

Digital CBT business models are based on a platform as a key resource and are dominated by activities in that context. Firstly, the **provision of a platform** on which patients can receive therapeutic offerings is the main activity. To ensure the functionality of the platform, ongoing maintenance and software development are crucial. Secondly, the tool provides service offerings, for which the **therapeutical concept** must be developed. Due to automated services, this is an initial activity when the business is set up, meaning that services need to be reviewed and approved ongoingly. A decisive success factor is the DIGA approval

that the costs for the therapeutic program can be reimbursed. The process of **obtaining DIGA approval** requires the company to prove its therapeutical approach's effectiveness. In that regard, a clinical study to **evaluate and prove the effectiveness of treatment** must be conducted (see chapter 4.3). Finally, to reach a broad audience, **platform promotion** is a critical success factor for the scalability and profitability of the business model. This promotion must follow a push-and-pull approach (see Appendix 2.2). On the one hand, both the doctors and therapists must be the focus of marketing activities, as they are prescribing the treatment and pushing the application's usage into the market. On the other hand, customers must "pull" and demand the product by requesting the prescription of precisely that company. This can only be achieved if customers are aware of the company's service offering and value proposition. These push-and-pull marketing activities must convince both the patient and the therapist of your platform. "*On the one hand you have the patient, on the other hand you have the therapist, who you have to somehow convince to do it via your platform and not in any other way*", as Marie-Therese von Buttlar stated (see Appendix 2.1).

5.7 Channels

Distribution channels connect a firm's value proposition and its target customers. Distribution, communication, and sales channels are customer touch points that are central in the customer journey. They can be divided into "own channels" and "partner channels" (Osterwalder and Pigneur 2010).

Own channels in the digital CBT business model can be described as the channels where companies directly interact with the client. The primary channel is the platform, either in form of an app or a website, where the service is delivered to the client (Stern et al. 2022). The platform is both the distribution and sales channels through which the products are used and purchased. Furthermore, it has a communication function for the service offerings. Self-

managed social media accounts function as pure communication channels and are essential to service offering promotion and customer awareness.

Partner channels are channels where dCBT businesses interact with intermediaries such as psychologists or general practitioners. For digital CBT, the distribution via partner channels is of higher importance than in-house channels, as they are responsible for prescribing the therapy and interaction and relationship building. These channels are critical success factors for the business model.

5.8 Cost Structure

The cost structure outlines the central expenses involved when using a specific company model. Costs are incurred in the processes of value creation and delivery, customer relationship management, and revenue generation (Osterwalder and Pigneur 2010). In the following, the variable, fixed costs, and customer acquisition costs of the analyzed companies will be outlined.

Fixed costs are independent of the quantity the company sells and occur in dCBT business models as initial investments and running fixed costs. The initial investment includes the platform's technical set-up and the therapeutical approach's development. Ongoing research and development, software maintenance, support functions, marketing and sales, and licensing compromise the running fixed costs. The costs associated with the DIGA approval are another cost factor for the companies. The costs lie firstly in proving the effectiveness of the treatment through a clinical trial and secondly in the cost associated with the process of obtaining approval. The process cost ranges from EUR 3000 to EUR 9900 for the application of the final listing, plus the assessment of the proof of positive healthcare effect of the treatment method, which again ranges from EUR 1500 to EUR 6000 (Krankenkasse 2022). Running fixed costs are mainly driven by customer acquisition and personnel costs. On the one hand, customer acquisition costs are high, as the promotion should follow a push-and-pull approach (see chapter

5.6), and the market is highly competitive. On the other hand, the personnel cost accounts for a majority of fixed costs, as administrative functions are needed.

Most of the service offerings can be scaled to a large customer base without additional cost, especially since most business models are based on automated services. Therefore, economies of scale can be achieved easily. **Variable costs** are mainly driven by the share of one-on-one therapy sessions. Other minor variable costs occur through customer services.

Customer acquisition costs (CAC) are one of the main cost drivers of a CBT business model, as a two-sided promotion model has to be applied including marketing expenses to target GP´s and customers (see chapter 5.6) The important thing to note is that CAC can include both variable and fixed costs, and both one-time and recurring expenses. The costs involve sales and marketing expenses, and a high investment is necessary to grow a large customer base to achieve the aforementioned economies of scale.

5.9 Revenue Streams

Revenue streams can be divided by the type of service provided. They involve transactional revenues from one-time payments (e.g., sales), or recurring payments (e.g., a subscription). Within digital CBT models, both types of revenue generation can be observed, and according to Marie-Therese von Buttlar "*it depends a bit on what your model is*" (see Appendix 2.1). Furthermore, it can be distinguished between revenue streams reimbursed by insurers and out-of-pocket payments by patients.

The revenue is on the one hand generated by obtaining the reimbursed amount from the insurance. However, there are differences in the type of revenue streams, as some companies require one-time set-up costs in addition to the licensing fee. A **one-time payment** is, for example, required by Somnio, which charges an initial fee of EUR 224.99 in addition to its subscription fee of EUR 224.99. Another startup, Vorvida, charges an initial payment of EUR

192,01 for the set-up of the account. However, these are the only two companies requiring such a fee. Generally, the **licensing fee** is paid for 90 days and ranges from EUR 297.5 to EUR 620. The prices are dependent on negotiations with public insurance and the DIGA, as they are responsible for the price setting (see chapter 4.3). The following Table 4 depicts the exact revenue streams for each company per treatment duration.

Company	Service	Cost
Deprexis	License for 90 Days	EUR 297.5
HelloBetter	License for 90 Days	EUR 599
Invirto	License for 90 Days plus VR Hardware	EUR 620
Mindable	License for 90 Days	EUR 576
Novego	License for 90 Days	EUR 249
Selfapy	License for 90 Days	EUR 540
Somnio	License for 90 Days	EUR 464 (licensing); EUR 224.99 (initial fee)
Velibra	License for 90 Days	EUR 467
Vorvida	License for 90 days	EUR 476 (licensing); EUR 192.01(initial fee)
Nicht Raucher Helden	License for 90 Days	EUR 239

Table 4: Description of revenue models (Krankenkasse 2022)

On the other hand, there are companies solely relying on self-payment, as they are not DIGA approved. This is another revenue stream obtainable, however, as DIGA-approved therapy are fully reimbursed to customers. A customer will therefore choose a DIGA-approved company over one that has no approval, as it is free for him. In conclusion, the approval remains a major competitive advantage.

8. Realizability of Recommendations – NUF Analysis

In total, three strategic recommendations were identified to modify and enhance an existing business model in the mental health space. In this step, these recommendations will be evaluated based on three criteria, provided by a model for decision-making, the NUF framework: that the ideas are ***n****ew,* ***u****sable*, and ***f****easible.* Although decisions are normally ranked with this framework, we will use it to evaluate the three recommendations. Using this assessment method, each criterion gets a score assigned on a scale from 1-10, where 10 is the highest possible value. Summing up the three individual values gives a score to each idea. In general, the three evaluation criteria can be observed in other assessment methods as similar themes (Kudrowitz and Wallace 2013).

The criteria *new* is defined as an idea, that has not been tried within the industry before and is therefore new to society. *Usable* describes the value the idea delivers to consumers or stakeholders and assesses how an existing weakness or threat is solved. Furthermore, *feasible* refers to the ability to implement the idea in practice. Here, underlying criteria such as capital requirements, existing capabilities, and technical feasibility need to be evaluated (Kudrowitz and Wallace 2013). The recommendation with the highest overall score has the highest potential of delivering value to the business, as it is new and usable to customers and is feasible. Applied to the recommendations we created the NUF analysis, depicted in Table 5.

Evaluation Criteria	Tech Implementation	Customer Empowerment	Predictive Analytics
New 0 (has been done before) 10 (has never been done before)	6	9	6
Useful 0 (does not solve the selected problem, and creates new problems) 10 (perfectly solves the selected problem, without creating new problems)	6	6	9
Feasible 0 (requires great effort and investment to put into practice) 10 (very simple and cost-efficient to put into practice)	4	7	3
SUM	**16**	**22**	**18**

Table 5: NUF Analysis of proposed Recommendations (own illustration)

Tech Implementation: When compared to the other two recommendations, the NUF analysis of the tech implementation recommendation received the **lowest score**. This is partly related to the **implementation** capability, which can be **challenging and expensive**. We recommend implementing various tech building blocks, as previously discussed in detail in the recommendation. Companies should leverage Artificial Intelligence to communicate with their patients more effectively and efficiently, introduce Gamification for a playful effect within therapy interventions, and Virtual Reality to create a realistic environment for specific situations. These three technical integrations are not new to the market and have been used in various ways by other companies within dCBT. With a score of six, the implementation has the potential to give the company a **competitive advantage**, as these integrations provide different use cases. The tech implementation recommendation was also given a six in terms of usefulness. This demonstrates that it solves the addressed problems but still needs to **work perfectly**. Tech-related issues, in particular, run the risk of introducing new issues, as implementation frequently necessitates a thorough education. If not done correctly, human errors can occur, as well as

display errors and technical issues that providers are unfamiliar with. As previously stated, feasibility received the lowest score within the technical recommendations. Four points indicate that the recommended technical implementations are expensive and frequently require additional effort and investment. Software, for example, must be developed or purchased and integrated with an existing website/app. Furthermore, **clinical studies are required** to obtain DIGA approval, which requires time and capital.

Customer Empowerment: When conducting the NUF analysis of our recommendations, we gave our second recommendation, customer empowerment, **the highest sum of score** because it can be seen as the newest and most feasible recommendation of the three proposed. As described, we recommend implementing client empowerment in two ways: personalizing care and introducing P2P networks that enable communication between clients with similar mental health problems. Generally, the introduction of P2P networks is not very new to society, as many platforms use this model, such as Facebook or even other digital health tools (often physical health tools). Nevertheless, the usage of P2P networks can be seen as a very **new way of engaging customers in the digital mental health space**, especially in Germany. Until now, no DIGA-approved digital therapeutical tool has included network effects in their business model, hindering the fast scalability as well as customer retention of a firm. Including network-effects leads to large amounts of data, and therefore, better and more specialized therapy treatments. Our interviewee, Marie-Therese von Buttlar, proved that including network-effects can lead to better engagement and hence better customer retention and differentiation from competitors, as well as brand image. Moreover, customer empowerment can be seen as a **useful** recommendation since it leads to higher data availability and care personalization, lower stigmatization and customer acquisition costs, along with higher customer loyalty. Compared to the two other recommendations, tech implementation and predictive analytics, we found that customer empowerment would be the **most feasible** strategy

adjustment. Since the implementation of a P2P network is seen as an add-on service to the existing business model, the development of such a chatroom, for example, is still expensive, but less than including various new technologies or developing entirely new algorithms for data usage.

Predictive Analytics: The overall high score of the recommendation to implement predictive analytics is mainly driven by the usefulness dimension. Concerning the newness, predictive analytics are only innovative in regard to the extent used. In general, the usage of data to predict health outcomes and improve treatment methods is not a new concept. However, the amount of data available combined with the intensity of the analysis drives the degree of newness. Yet, usability is significant as it enables companies to identify risk factors within the life and characteristics of customers. This enables the **prevention of mental health illnesses and the identification of trigger factors** leading to an overall better health outcome. However, the feasibility remains relatively low, as regulatory barriers remain significant regarding data usage. Even though customer empowerment rises, and regulatory efforts are made, the development of systems collecting comprehensive data still needs to be improved. Furthermore, the set-up of such a data system and the development of the associated analysis remains costly.

In conclusion, **customer empowerment** proposes the most promising recommendation to enhance the business model, as it offers a new way of engaging customers in the highly competitive mental health space. However, as tech implementation and data analytics also show promising aspects, the interdependencies and synergies between these three recommendations build up to the added value to the business model.

The NUF analysis, as well as examined recommendations and methodology of the work, incorporate some limitations that are depicted in the next chapter.

9. Limitations

Regarding the critical appraisal of this work, it should be noted that there are some limitations to consider. These are divided into three sections below: Limitations of the methodology, the criteria for the selection of the analyzed business model, and the recommendations.

Methodology: A bias in results cannot be excluded due to the selection of interview partners in the semi-structured interviews. The characteristics of the interview partners are not equally dispersed and hence not adequately representative, limiting the generalizability of the results. Considering that two of the respondents had invested in the success of the company concept, a bias in favor of the effectiveness of the business model seems plausible. Furthermore, the two respondents with mental health issues had no prior experience with digital mental health programs, which permitted objective observation of the digital business model and kept the focus on experienced challenges of traditional therapy. Here lies the potential for further research with patients receiving digital mental care previously. Further understanding the perceived strengths and weaknesses by clients of each provider would be of high interest.

Criteria for selection of business model: The selection of the digital mental health business model providing CBT restricts the work's validity, as the digital mental health industry also incorporates alternative treatment approaches. For instance, the inclusion of B2B2C therapeutical business models as well as of preventative business models would have added further value to the thesis, and industry understanding. Analyzing such business models would be of high relevance in future research. Furthermore, the analysis was solely based on DIGA-approved companies. Hence, the focus on Germany limits the work’s generalizability and prevents it from being expanded to other countries. For future research, it would be significant to deepen the understanding of other digital therapy approaches and explore business models that are not approved by DIGA.

Recommendations: To identify trends and reactions to innovations accurately, business models from other countries, such as the Americas could have been investigated more thoroughly. Furthermore, the provided recommendations are based on the foregoing analysis of advantages and vulnerabilities. The effectiveness of their implementation has been evaluated, however, not been tested. This is due to the editors' lack of expertise in technical integrations, which is why the NUF analysis should be considered a "direction" rather than a definitive statement. In this context, a discussion could have been held with a responsible official from the Ministry of Health or from one of the companies to more accurately assess the realizability of recommendations. Moreover, the medical effectiveness of the digital therapies was not included in the recommendations, as this was taken for granted and due to the absence of medical understanding of the group.

10. Conclusion

In the context of the growth of the digital mental health market due to socioeconomic changes, consumer change, and technological advances, this paper provides an in-depth analysis of digital therapeutic business models based on cognitive behavioral therapy. Utilizing digital treatments and the scalability of the business models can help solve the structural issue of the shortage of psychotherapists, enhancing access to mental health therapies by being more convenient, accessible, and engaging than conventional CBT. The analysis of dCBT business models was carried out by focusing on companies operating in Germany. The research was conducted using insights from appropriate literature along with five expert interviews.

The building blocks of dCBT business models were analyzed with the Business Model Canvas from Osterwalder and Pigneur (2010). The assessment revealed the high relevance of

key partnerships enabling the business models' functionality, efficiency, and scalability. The group identified four crucial stakeholders for the business model's success: government, insurances, psychotherapists, and universities. Their inclusion is relevant for developing the therapeutical treatment, regulative approval by the DIGA, and the reimbursement of used services, enabling the best treatment outcome for clients.

Moreover, the business models' advantages and vulnerabilities were analyzed using the SWOT-, and Porter's five forces framework (Porter 2008), allowing for the identification of advantages and vulnerabilities of the new business model.

Our research showed that dCBT companies are, on the one hand, operating in an attractive and growing market, whereas, on the other hand, competition, and customer attraction, along with client retention, are the main challenges of the new business model. Due to the fact that DIGA-approved dCBT models are treating similar mental illnesses, providers have low differentiation and customers low switching costs among services. It was found that, especially in the space with a high degree of asynchronous content and low customer empowerment, many companies are competing for market share. Furthermore, our group discovered a trend of company consolidations with similar positioning, supporting the hypothesis of mergers in the industry.

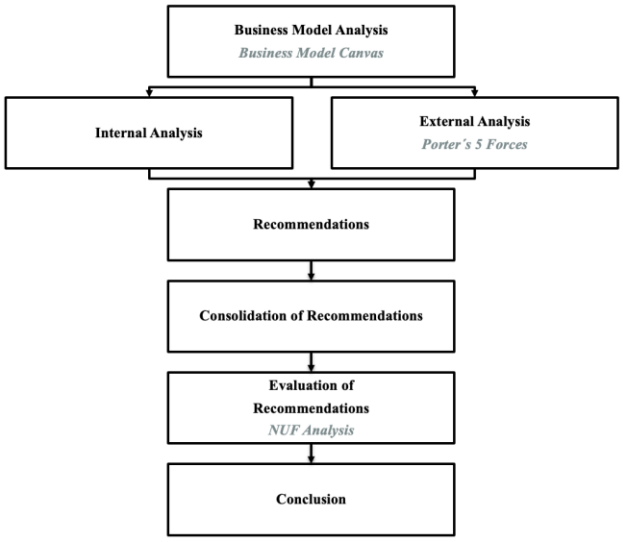
Based on the main issues of differentiation and customer retention, our group gave three strategic recommendations: Increasing the usage and availability of technologies, empowering consumers by leveraging personalized care and implementing peer-to-peer networks, as well as using data more effectively, allowing for better services. Our group's analysis of the proposed recommendations using the NUF framework showed that empowering customers should be prioritized since it is the newest, most useable, and feasible solution compared to the other propositions.

Worth mentioning, the field lab's research and generalizability of outcomes are limited by the specific business model's focus and country selection, along with the work's methodology.

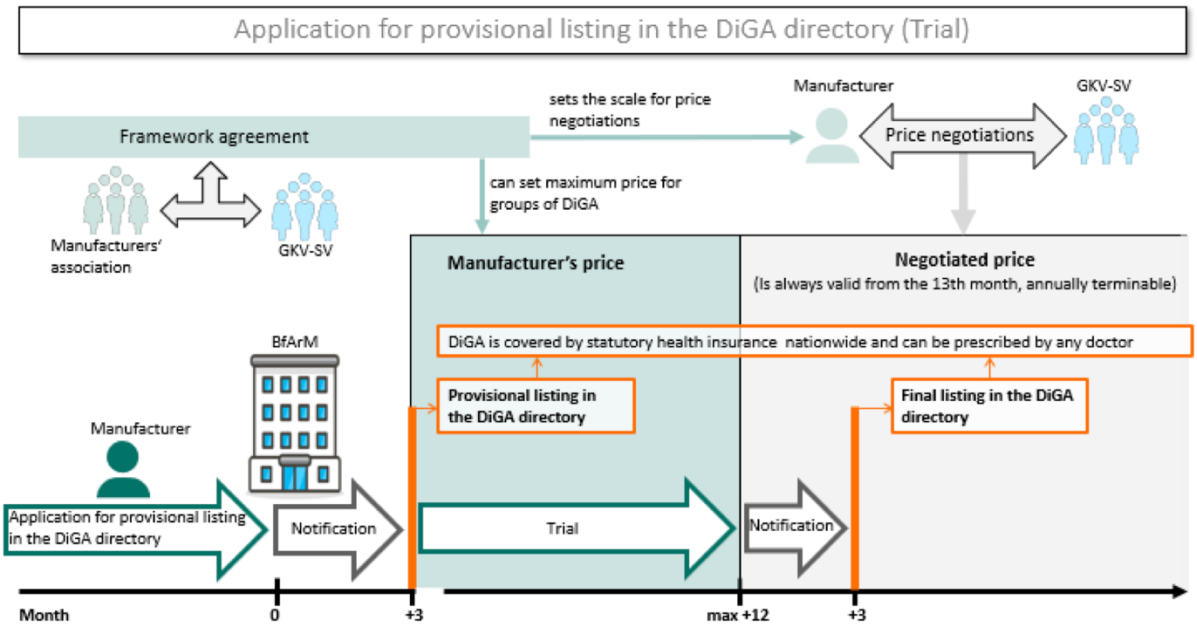
Appendix

Appendix I: Tables and Figures

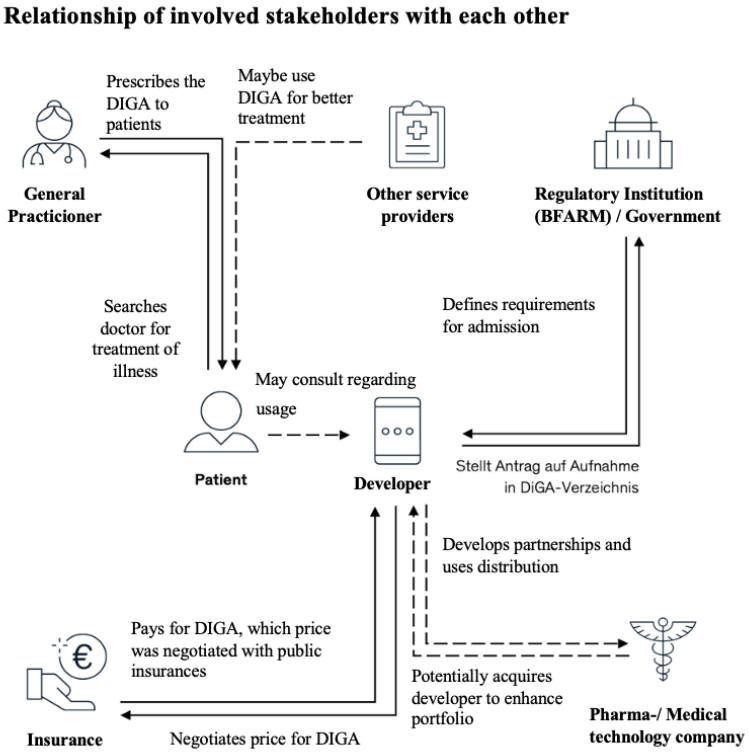
Appendix 1.1: Structure of Analysis (own illustration)



Appendix 1.2: DIGA application process for provisional listing (BFARM 2020)



Appendix 1.3: Relationships of involved stakeholders in the DIGA subscription (own illustration after BfARM (2020))



Appendix 1.4: Business Model Canvas (Osterwalder & Pigneur 2010) of the dCBT BM

Key partners
- Psychotherapists and General Practitioners
- Software Developer
- Government (especially BFARM)
- Cooperative partnership: Universities that research and give evidence for the success of the tool
- Insurer

Key Activities
- Offer a platform to provide the service Development of a therapeutic approach
- Ongoing Software development
- Platform promotion

Key Resources
- Workforce
- Software development
- Funding and financial resources
- Intellectual resources by scientists, psychologists
- Licence by government

Customer Value Proposition
- Accessibility, availability, flexibility & convenience
- Less exposure to stigma and discrimination
- Affordability
- Mass personalization

Therapists Value Proposition
- Access to client base
- Flexibility & Reliability in scheduling

Insurers Value Proposition
- Cost reduction through preventive care
- Innovation

Customer Relationship
- Automated services
- (dedicated) - personal assistance

Channels
- *Own channel:* website, app, social media, newspaper
- *Partner channels:* psychologists, generals practitioners

Customer Segments
- A niche market for self-guided therapeutic services dependent on the targeted mental health issue
- Low-to-mid severity of mental health illness
- Age group between 18 and 65, mainly woman
- Geography: Germany

Cost structure
- Fixed costs (R&D, initial investment for setting up the platform, support functions, software maintaining, CAC, Licensing)
- Variable costs (therapy sessions, customer support)
- Economies of scale (e.g. Marketing Activities)

Revenue Streams
- Usage or Subscription fee per therapy session
- Licensing fee

Appendix II: Interview Transcripts

Appendix 2.1: Interview 1

Interview 1	
Company/ Focus Group	Earlybird Venture Capital
Contact Person	Marie-Therese von Buttlar, VC Investor
Interview Date and Format of Interview	16th October 2022; Online

Marie-Therese v. Buttlar: Yes. Now I see too. The recording has been started.

Interviewer: Great. Could you introduce yourself again, where you work and why you are an expert in mental health?

Marie-Therese v. Buttlar: Sure, you already know my name. I work at Earlybird Venture Capital as an investment associate and mainly deal with start-ups in the consumer, foodtech and digital health sectors. In the area of digital health, I also look at a lot of start-ups that are in the mental health field and therefore get to know the development of the industry and the current state very well. I have already looked at countless new mental healthcare ideas in the areas of B2B, B2B2C and B2C.

Interviewer: Thank you very much for introducing us. So, let's go. So, our first question would be, how would you assess the health industry, the development of the health industry in the last decades? Especially in the mental health sector. What changes have you seen and what business models have emerged?

Marie-Therese v. Buttlar: So the last decades, I have to say, I'm only 30, 40 myself, I would rather talk about the last decade, I think. Um, I would say that in the health sector, and I'm mainly referring to Germany now, that a lot has already happened in the health sector, especially probably in the last three years or so. So with the whole DiGA and e-prescription and so on, I think a lot is being done to really develop the health sector. And I think a lot of it is very relevant, especially in the mental health sector, because of course you can do a lot of things digitally, compared to many other areas where you really have to see people or touch them. That's why I think it's especially the market and everything that enables remote diagnoses and therefore also mental health. I don't really know how the whole clinical aspect has changed. So how treatments and such things have changed, I can't judge that very well. I just think that what has come very, very strongly is simply all these direct consumer models, both digital products and really remote sessions. And I think you always have to look a little bit at who the target

group is. Is it really about clinical issues or is it more about pre-stages, stress and so on? Because I think there are also strong differences in the business models, because with all these preclinical ones you don't normally have a real component. And with all these clinical ones, the existing health system already plays a very big role. By bringing yourself into this team. And so on.

Interviewer: Yes, exactly. Um, once again exactly on that. In the Master's thesis we are focusing on the B2C sector. Um, we exclude, but I would say the mental wellness area. So what you're saying, these preliminary stages like meditation apps or the like, and we're going to look at the therapy area, the business models that are actually always based on Cognitive Behavioural Therapy. We compare the traditional business model in terms of face-to-face therapy with the new money in terms of effectiveness. But in terms of the business model exactly. Maybe again in relation to that, what would you say is the value proposition, the value add of these digital business models, especially compared to traditional therapy?

Marie-Therese v. Buttlar: Well, I think one issue is definitely accessibility. I think it's a very big problem that you often have to wait a long time for therapy places in Germany. And that you can do a bit of load balancing through these digital models, that you distribute the capacities better because you are not dependent on people on site and that you make the whole therapy a bit low-threshold for the people because you don't have this physical barrier. You don't have to go there and integrate it into everyday life, but we can do it more flexibly from home. And on the other hand, I think it also has a component that makes it a bit easier for people if they can't see the person on the street or something, with whom they are doing their therapy.

Interviewer: So you would describe that exactly as stigmatisation?

Marie-Therese v. Buttlar: So maybe you could. Well, I think that for many people it is simply a big effort to really go somewhere in person, because it is stigmatised.

Interviewer: And what would you say that many business models are looking at? What would you say is the customer profile that these digital business models are targeting? So who are their consumers in the sense of patients, for example?

Marie-Therese v. Buttlar: Yes, that's a good question. But I think there are also CBT things that are a bit easier. So for people with not very bad problems. But I think there are also some that are really a long-term therapy and for people with very severe problems. I think the really clinical cases you probably don't have in this remote case. So the people who have really serious problems are probably more likely to receive therapy on site. And I can't tell you exactly about

the age or something like that. I had the feeling that it's more likely to go to younger people, but I don't have any facts to support that. That would just be a bit of my feeling.

Interviewer: So our generation from 18 upwards, so to speak, but not the older generation.

Marie-Therese v. Buttlar: Yes, I do. I find it difficult to say, but I think maybe not the 80-year-olds, but maybe also a little bit older, I would think, even adults.

Interviewer: Um. Okay. Right. And in the course of that, again. Who do you think are the stakeholders involved in a digital therapy model?

Marie-Therese v. Buttlar: Yes, I think very many. And I think that's also a bit of the difficulty of the whole thing. On the one hand you have the patient, on the other hand you have the therapist, who you have to somehow convince to do it via your platform and not in any other way. So from the business model perspective. On the other hand, you have the whole regulatory system and insurance companies and so on. I think it's actually quite pleasant in the mental health sector, because you can go a lot via existing reimbursement codes and so on, and you can also bill the digital products a lot via the DiGA and so on. But I think the difficult thing with such digital models, especially those that go B2C, is how do you get the customer into your channel or the patient in that respect, because of course with such clinical topics you often have people first going to their local doctor and then starting their journey. And that's where it depends a bit in B2C. Are you someone who somehow gives psychologists a tool that they can do their hours remotely? Or are you really an app that has its own people somewhere who then give the lessons and so on? And I think, depending on what your value proposition is, you have different difficulties with different stakeholders in this system.

Interviewer: So you see insurance as a very relevant stakeholder?

Marie-Therese v. Buttlar: I think that if it is not reimbursed, that would be a problem. But it is actually reimbursed. That's why I think at the moment it's just something that's ticked off. So I think it's more in areas that are not mentally healthy, where you still have to make an effort to become a winner or so to speak.

Interviewer: Yes, okay. Um. How would you say the companies generate revenue?

Marie-Therese v. Buttlar: Yes, it depends a bit, I think there are some models that really pay per hour. So it depends a bit on what your model is. If you just have an app that somehow has content and self-learning content and some kind of asynchronous things, then it's usually a

monthly fee. But if you really have either exclusively or a component that's really remote therapy, then you usually pay per session. And with DiGA's it's actually like you get an amount and then you get reimbursed once. But I think they would have to check that again. In the first year you can set the price yourself or in the first two years. And at some point, a price is set for your product. And then you just get this lump sum from the insurance company and that's it.

Interviewer: The DiGA sets the pricing, so to speak, after a certain period of time.

Marie-Therese v. Buttlar: I think so. But as I said, look it up again.

Interviewer: Yes, but we actually didn't have that at all. And what would you say are the biggest challenges for business models that are now either established or emerging in the digital therapy field. So kind of company specific or macroeconomic factors or whatever you mean?

Marie-Therese v. Buttlar: I think competition is a big issue, because this mental health space is just incredibly busy. And to really stand out and make it clear that there is now a difference compared to others is, I think, super difficult. And the second thing is, if you really have something, to get the patients, because this is mainly the difficulty with DiGA. The doctors have to prescribe the DiGA. If the doctor diagnoses you, then he says yes, okay. And as a therapy I would now suggest that and the DiGA. But the problem is that doctors simply don't do that. And that's why it's really difficult to get clients as a DiGA. You can look at the figures online and see how often which league was prescribed in the last few years. The numbers are super low because the doctors are not incentivised to do this, because they get very little that they can charge for explaining the DiGA to the patient. And everyone who does a DiGA would have to go around to every doctor like a pharmaceutical salesman and tell them about his product. And that's why I believe that this acquisition channel via doctors is very difficult and that's why you have to use these self-pay and a little easier models.

Interviewer: Would you then say that the digital business models that focus on therapy and at the same time either as a platform to simplify access to therapists or have therapists employed themselves, which is what you meant earlier. Would you then say that these are, so to speak, two-sided business models that offer a value proposition to the customer or patient on the one hand and to the psychologist on the other? And it doesn't work without these two-sided stocks.

Marie-Therese v. Buttlar: I think that's always the case with a platform like this, that it has to have advantages for both sides. Yes. So maybe you could say that.

Interviewer: That it is two-sided?

Marie-Therese v. Buttlar: Yes, I think it's probably a bit more complex for psychologists. Because if you are employed as a psychologist by a company, for example, then you can either be the content creator, in which case you don't really have a therapy any more, or you are really there as a therapist. But then the advantage for you could be that you have a secure job with less responsibility than if you have your own practice and so on. So I think it's multi-layered on both sides, but I think there are also models, for example, that really only provide the infrastructure, because it's more of a Saas, a Saas practice solution for the therapists, and I think there are already different approaches, also in the market.

Interviewer: Just then, maybe again, if we're talking about DiGA anyway. What would you say are the contextual or macroeconomic factors, especially in Germany, that promote or improve the emergence of such business models, so to speak.

Marie-Therese v. Buttlar: I think what you can see very clearly is that it is now becoming much more common in everyday working life and that companies are therefore pushing it much more proactively. However, I think that by focusing on BTC, it is a bit, a bit different, but I think it definitely helps to reach people better and to reach them earlier, before they become really bad cases that we are trying to get out somehow. Otherwise, I could imagine that society in general is more open to mental problems and that macroeconomic factors such as the covid lockdown, war and energy crisis simply bring more people as potential customers.

Interviewer: Yes, makes sense. Okay.

Marie-Therese v. Buttlar: I think so too. Perhaps another topic that I think is also a bit difficult is retention. So I think, especially when it's people who don't have such clinical issues, how often do you really do that? Once when you're in a bad place? But do you really do it on a long-term basis? And if it's really clinical cases, I can't say that much about that, because I haven't really looked at any of them. But I could imagine that it's also a bit difficult in parts.

Interviewer: How do you generally see, let's say generally, weaknesses in the form of this business model? In the sense that it might have long-term success or in whatever form.

Marie-Therese v. Buttlar: I'm just not super defensive. I just think you need, at the end of the day, if we really talk about this classic B2C, I somehow have psychologists sitting somewhere, either my own or from somewhere else, and maybe I also have a digital product. I ask myself

how much advantage do you really have as a first mover? What can you really differentiate yourself on in the long run? And I think a lot of brand. You have to get the psychologists, but I just think that it's not that difficult to set it up yourself. And if you are really in the reimbursement and really do the really clinical things, then I think it is already a hurdle to get the DIGA, so to speak, and it takes a long time until you get it. But otherwise, especially in these pre-clinical topics, where perhaps reimbursement is not the sticking point, I find that there are simply thousands of them and they can't really differentiate themselves in the long term.

Interviewer: Yes, that makes sense. Would you then say that you would see the digital business model, as a long-term solution? So we're talking about the therapy form again, in terms of, for example, treating depression. Would you say you see the possibility of the digital business models replacing the traditional face to face therapy format?

Marie-Therese v. Buttlar: *Well, I* can, I'm not a doctor and I know nothing about depression therapy. From my understanding of the market, I believe that it simply makes sense, because I think you have to solve it this way. Because you simply have few doctors, many depressed people. I think this is simply a sensible solution for everyone involved. I always look at it from a venture capital point of view, and for me this sustainable differentiation is what I would always look for and what I would sometimes find difficult. But I do believe that it makes sense from a rational point of view to do it online.

Interviewer: Yes, I see. And where would you say you see the mental health industry in the next 5 to 10 years? Or just this therapeutic mental health part?

Marie-Therese v. Buttlar: Yes, that's a very good question. Yes, I honestly don't know exactly. I wonder if there will be a bit of consolidation in this market at some point. But. Yeah, I can honestly go to that. I've looked at a lot in the market, but these really clinical ones, like Selfapy and so on, I've never looked at them so blatantly in detail. That's why I can't judge very well what the market dynamics really are for these models. I rather understand the overall market a little bit.

Interviewer: But can you imagine that there might be a technological component that could be integrated? For example, there is Invirto, which offers the therapy approach with virtual reality glasses, in order to be able to understand this, let's say, practical format and to be able to feel it. Do you see a trend there?

Marie-Therese v. Buttlar: Yes, I know it more from an area where it is used by psychologists on site as well as in remote therapy. Probably when you do immersion therapy or something like that. So if you have a problem with certain stimuli or something like that, that you then use it, for example, to re-enact this situation and re-enact your behaviour in such a situation. I definitely believe that. And whether you really have to sit at home with VR glasses to have the therapy experience, I don't know at all whether that provides so much added value. I think what you also see interesting could be this "Clareandme" from Berlin, which is trying to achieve things through non-human interaction, so they want a telephone bot that responds to you in a totally personalised way and that you then do your therapy with the boat rather than with a human being. So it's possible that there will be more components in that direction, but I think with really clinical topics... I don't know if you really fall back on something like that.

Interviewer: Well, I have to say, it says quite a lot of new content. That you have to differentiate yourself in the long term. We simply realised, okay, the differences aren't that big. And I think it's important to look at, OK, how do you position yourself? I think that's quite exciting. Maybe you have ideas about differentiation, differentiation potential, how to position yourself sustainably in the market?

Marie-Therese v. Buttlar: Yes, I think there are different approaches. On the one hand, you try to have a bit of a data network effect, if you can somehow use data sensibly for the business model, that I think there are companies that say okay, they use data to make you as a patient exactly the right treatment journey. So is your treatment journey more like a kind of meditation or is a treatment journey something else, and then they collect better and better data in order to really optimise this treatment part. And when you have more and more data, your recommendations become better and better and then it becomes more difficult for new players to get good data. But whether this treatment journey and which box someone is sorted into really makes the difference, I don't know. I think that's a bit of a theory. On the other hand, there is a bit of an approach to differentiate that says, okay, you go more via quasi classical network effects, that you say, for example, someone is trying to bring in a network personal component, so somehow P2P-networks or group therapy. And then, because you have more and more people, you can offer groups, therapies on much more specialised topics, because then, of course, the more people there are, the better your product will be, because you can offer more specialised groups, for example. So my child has anorexia and that's why I'm done. And then you have ten mothers sitting there whose children are anorexic? Well, I think that's another thing I've heard before as a logic of how it could work. And then... I do believe that Brand is

something that can work, because I believe that a lot of trust is good. But Brand is just a bit less tangible, I think.

Interviewer: Yes, but I think it makes sense.

Marie-Therese v. Buttlar: Yes.

Interviewer: I think it was all the questions.

Marie-Therese v. Buttlar: Yes, yes. Very nice. Let me know if there's anything else.

Interviewer: Yes, great. You're welcome. Thanks for your time!

Appendix 2.2: Interview 2

Interview 2	
Company/ Focus Group	HelloBetter / DiGA approved Company
Contact Person	Daphne Petrich, Senior Business Development
Interview Date and Format of Interview	28th October 2022; Online

Interviewer: Hello Daphne, thank you for having this interview with us. The recording has been started. Could you introduce yourself again, where you work and why you are an expert in mental health?

Daphne Petrich: Sure, my name is Daphne Petrich and I work at the start-up HelloBetter as a senior business development manager. During my last year at HelloBetter I got to understand the industry and especially HelloBetter quite well. I think the industry has changed a lot in the last years and I am happy to talk with you guys.

Interviewer: Thank you very much for introducing you. Could you maybe give a short intro of HelloBetter?

Daphne Petrich: So give a bit of an overview of Hello Better. And then what I do there. Yeah. Yeah. So I joined Halo Better in January to lead the international expansion arm. Right now it's still just a team of one, but hopefully it will grow. And so but the company is is quite old, you know, it really has been in the making since even 2012 when two or three PhD students started researching this is CBT. So Internet CBT therapy is. And so each of them kind of developed their own online program in a way, kind of like an online course where you educate so you deliver a lot of psychoeducation, but really you're trying to enact behavioural change. So that's the whole the whole promise of CBT, which has been very, very well documented, is that it's very quick in generating outcomes, right? Reducing symptoms, changing behaviors and making them conducive to overcoming whatever mental health condition you're experiencing. So that can be depression, insomnia, anxiety, etc.. And so these students really were researchers, but they all generated really promising clinical outcomes, so promising that it was either in terms of clinical outcomes equal to face to face CBT therapy or actually better than. And so that's when they decided to spin off as an actual startup. And for a few years from, I would say 2014 to 2018, they were a bootstrapped startup, really just trying to turn these these programs that were really made in a research context and turn them into a commercially viable program. So at first they were outsourcing to a software platform, so they didn't own the platform. And then

in 2018, they decided to really professionalize the business. And that's when they brought in some some techies, some some business people and hired in our current CEO harness. And that's also when they started their first VC pitches and and looking for investments. So I think that's a really important background story because it's thanks to this decade that we've been able to generate a lot of clinical data. And that's really what will differentiate us from most apps on on this, right. It's that a lot of the apps are are able to to generate a lot of real world evidence and adapt to user behaviors. But very few have actually tested the clinical efficacy right by how much did symptoms reduce for how many people etc.. So. In 2019, I'm sure. Are you familiar with Diga?

Interviewer: Yeah.

Daphne Petrich: Yeah. So I think that's a very important, I guess. Thing to note about. Hello. Better is that we really we were not a direct to consumer company and I don't even think I would classify us as a direct to consumer company today. Before we worked via selective contracts with insurance companies, they were either preventive or treatment contracts. There are numbers. You probably know them. I think it's paragraph 20 and something else. I can look it up if that matters to you from the. Yeah, I mean, everyone always says it in German, but the the Social Security Care Act or something. Yeah. Yeah. And so, but when Diga came out we changed because from a business and business model standpoint, you're either you have each insurance company is a client or you have the standard of care model where you are technically covered by most insurance companies. So now our strategy is very much getting as many of our products cleared as possible listed on the directory. And then, of course, I think a big slap in the face was realizing that. That regulatory approval or reimbursement does not equate adoption. So now enters a bit more of a if you want to call it DTC strategy, but it's like, okay, so technically anyone who has chronic pain could access our therapy for free. That's true for 98% of Germans, right? Yeah, but how many are actually using it? How many trust that it would work? How many know that it exists? Right. And so this is where we realized, wow, we have this amazing value proposition that's clinically validated and it's free. But now we need to get doctors to prescribe it and patients to use it. And so this is where we're kind of using this two pronged approach, which most of our competitors are doing the same as well. So you do health care. You market to health care providers because they're the prescribers in Germany, it's it's psychotherapists, but it's also doctors. And then you also target customers directly because they I mean, the best thing that can happen to kind of generate a lead like a good prescriber, is to

have a patient going to the prescriber being like, Please, can you prescribe me this chronic pain therapy? So we're really going with this top down, bottom up. But it's it's really hard because it's a brand new industry and it's so much education for everyone for for the prescribers and for the customers.

Interviewer: Yeah, that's that's what actually the main point we thought of as well that the probably not sure, but probably the adoption rate got quite high during COVID and because of like lockdown regulations and like now after that basically retention could be the main challenge for, for you or for startups in the space.

Daphne Petrich: I don't know that it's we are not experiencing this curve that you're describing. It's more that we were expecting this and it's slower and slower because and it's not our competitor is not in-person therapy at all. No, there is such a shortage of providers that the average wait list is six months, if not more so. So we're really competing against nothing. And and I mean, we have a lot of psychotherapists who work with us and we work with a lot of psychotherapy clinics as well, because this can be a treatment that is that starts before you start talk therapy. It could be during so you do all this psychoeducational piece and then you go into therapy to really process. I mean, our app is not going to help you understand your deeper issues with your mom. I don't know. So, you know, there's there's some things that we can address. We can help you identify your stressors, you know, change how you behave, change your perspective. So much of it is about helping you adopt a new perception of of the problem. But then nothing beats face to face therapy for other utilizations. And finally, one area that we're now exploring is is discharge management. So in a lot of cases, if you're discharged from a hospital, there's very, very little that hospitals are doing to avoid remission rates. And so someone who's not mentally well is someone who is less likely to adhere to their treatments. It's someone who's more likely to come back. And so I think in theory, this is a promising route and we're exploring it. So we'll see.

Interviewer: And so so you mentioned you're working through basically different channels to get to the customer. So one is the the descriptor like a psychologist, the other one is the direct to consumer, which is, I don't know, let's say, for example, social media or ads or something. And so those are like relevant partnerships you have to establish or channels you have to establish and is the channel with the insurer. So do you form sort of additional like partnerships with insurances or is that over since you get approved?

Daphne Petrich: Yeah. So it used to be really important. Our relationships with the insurers Barmer was one of our first partnerships. And to this day, I mean, they are probably the reason we stayed afloat the first like three years. And we still work with them today for prevention contracts. So I think that there is a route that is in the making for Germany for prevention programs. But for now we still work with a select few insurance companies on selective contracts or prevention or treatment programs that are not listed.

Interviewer: Yeah.

Daphne Petrich: Yeah, that makes sense. But it's it's not. It's no longer something that we are. Let's just say we we accept inbound leads and we deliver with our existing clients, but we're not pursuing this avenue so much.

Interviewer: Okay. And like, talking about actually, like customers, do you have a sort of a customer profile or your segment? You say this is our target group. We are tailoring our services to.

Daphne Petrich: Are you talking about the person using the program or the interns? Yes. Yeah. I mean, that's on the better side. I think our competitive advantage is that we have so many programs and for each we have a clinical study. Most of our competitors, they have one program and one or two studies. We have ten programs and 33 studies. But we also have sometimes the same employee count as our competitor who only has one program. And so that's also a bit of a curse, which is that we we really need to become better at creating a whole task force against each condition or indication that we're we're treating. We have one for for vaginismus, which is a sexual health disorder in women, and then we have sleep or chronic pain. These are so different. I mean, one one of these programs doesn't even can't even be used by by men. So we need this this target market is. Yeah. I mean, my answer is we need it. But for now, we don't actually have a target market. Our performance marketing team might be, you know, testing out different demographics, but we don't have this vision for who is the user of tomorrow. I will say that most of our users at the beginning of the year and most of the people using our degrees were women in their forties or fifties. And this was super surprising because I guess in your head you're telling yourself it's going to be like maybe young millennials or something, but actually not at all. I mean, in the world of degrees where we're seeing this, that like 80% were women, it's changing a little bit Now that we're getting we're getting better at social media and

Instagram ads more specifically. So this is making our reach a bit younger in terms of demographic and also more diverse in terms of gender.

Interviewer: Mm hmm. Okay. Yeah, very interesting. Actually, maybe not the question. So you said that your company is there for over ten years and you described some changes that have evolved in the last years. But do you see any other changes in the health industry? Maybe so, You said, for example, that there is like an adaptation failure or maybe just not as much as adoption as you wish for, but was there was this over the whole time or did it change from the beginning and was there more adoption and less stigmatization?

Daphne Petrich: Yeah. So I think that when Diga happened, everyone was like, Wow, this is going to really allow it to skyrocket. But this lack of adoption, it's it's generalized to the whole industry. It's not us. It's it's everyone. And it's there's a lot I can share some articles. There's a lot of people who see this as a failure and a lot of people who say, guys, this is a new industry and health care. This is the quickest we've ever innovated health care ever, right? You look at we still don't have e prescriptions, right? This this is huge. In fact, for for the German government, something new that's going to happen is that other European countries are going to follow suit. France is is next. And they basically enacted a law very similar to the law last year. I've been waiting very impatiently since July for the decree to come out. Lots of delays, but they're they're developing a very, very similar legal or reimbursement pathway for digital therapies. Their definition is a bit wider. They actually include tell us, you know, surveillance is remote patient monitoring. And so they. I guess I don't know if this matters to you, but for Degas, you're not allowed to include a human component with therapeutic advantages. So if I have an app, a CBT based app, and I can speak to someone via the app, whether it's video call or text, this conversation cannot contribute to the clinical outcome. So we have a coach on the app, but the coach is there to ensure that the intended use is being respected and to ensure the safety of the patient. For from a business model perspective, this is quite problematic because if you wanted to enter these blended care models where you know, an easy patient can do just the program, but maybe someone a more complicated patient, you could integrate maybe weekly check ins. Well, in Germany, you can't really have a business model like this or you would have to do a self pay add on. I don't even think you would be allowed to connect them in France because they're introducing this tele surveillance to remote patient monitoring components. It allows for these perhaps these business models to arise. Another huge challenge in Germany is that you're not allowed to do anything with the data that you get from data. Right?

So all the pharma companies are so excited about this, they reach out to us and when we tell them, yeah, we can partner, but we can't give you any of the data, then that's when the conversation finishes. I'm not sure that all the other countries in the EU will adopt this as a model and in the US that will look different.

Interviewer: You can't do so you can't give out data to other to others. But you can use, for example, your data to improve your own services, right? Yeah. Okay. Yeah, but that's very interesting. Yeah, that makes makes really not that much sense.

Daphne Petrich: I mean, I think at first I felt so frustrated. But I think if you enter this mindset of health care disruption and really answering patient needs and you start with this step care blended care model idea that I'm sure we all share, the fact is, in order to get there, you need to start with with very actionable laws and and the strictness of the data is actually probably the only way we will get there. So in a way. The reason why France is so delayed is because of this remote patient monitoring like Claus. And there's going to struggle even more because the more complexity you add, the more difficult it is to implement. So, yeah.

Interviewer: That makes sense. And so you said those are the main challenges you're facing. What are, in your view, maybe like opportunities for health better in the next time, years, whatever you would say, like where like from a macro context, but maybe also for the firm itself? And what are there like any, for example, implementations or other like technological advancements you are planning to do or something like that?

Daphne Petrich: Yeah, I mean, there's a lot. Do you want me to stick to the German side? Is that the most interesting for you?

Interviewer: Yeah, probably. But also like in a in a broader space would also be very interesting.

Daphne Petrich: Yeah. I mean, in terms of opportunities for our products, we're quite proud of. If I look at the market, I think a lot of the apps out there, they either have an incredible brand or user experience, like it's really nice and beautiful and easy to use or you have really a lot of evidence and a lot of research that it works, but it looks awful and is super gimmicky. And I think we're really quite good at doing both. But we can get even better in terms of the the user experience, not so much design, but maybe in introducing more AI generated tools to, you know, for example. From the way that you behave in the first unit. Can we know if when you're

going to drop off? Can we predict when you are most likely to drop off? And then can we actually intervene at the right time to lengthen your treatment? So really exciting stuff that the team is doing. This is in the short term, very easy, right? Everything around retention in the super long term. Now, this is probably just a personal opinion. It's that we have ten different products. But what if I have insomnia and depression? Is there a way to use AI to take content from both of those programs and combine them in a personalized way? For me to respond to it as best as I can, because it's not that simple. The rigidity right now of the ideas makes it that they're really packages, but people are much more complex than that. And so I think this could be a really exciting opportunity. So that's kind of the product piece. But then in terms of of the industry and what's exciting, it's I think right now guys are almost going to become a commodity and that's not necessarily a great thing for for a business model. You know, you have a one off price that's reimbursed by insurance companies. It's mandatory for them to reimburse it. They're not happy about it. Our prices are getting slashed. I don't know if you're following this. Right. But after one year of negotiations, we just got our chronic pain was just published right where at 240. And people are congratulating us. But we were at 599 before. So we kind of have to three x are our users to get to the same point as we were yesterday. So because of that, we're going to have to get a bit creative about how to leverage Dga's and maybe we need to go beyond just being a manufacturer, but to be a real mental health platform. You can be a concierge, you can take someone in. Hi, Daphne, You're feeling this way. Okay, there's Zika, but there's other things. And so it's happening in the US where there's a lot a lot of mergers and consolidation of all the mental health players. I suspect and hope that in in Europe we'll start doing the same where a lot of these telehealth players could actually partner or merge with the players. And actually because the burden right now is still so much on the patients to get smart about these things. And you don't want to do that if you can't get out of bed because you're depressed. So, yeah.

Interviewer: Yeah, that that makes a lot of sense. And regarding you mentioned the prices. I actually saw a statistic yesterday and I didn't really get it. But why do you have to adjust your prices that much? Does the digger say this is way too expensive for the insurance or no?

Daphne Petrich: So basically the first year you self price there is a maximum price for the first year, but you basically assess it based on a few metrics. I can send you some slides about this if you're interested. And after the first year you meet with the GALVAO as well, and you have four meetings with them, and after the four meetings, if you don't talk about your clinical

evidence, it's all about your evidence. It's the improvement of the clinical outcomes, basically improvement of care. And if you don't agree on something together, which by the way, no one has ever agreed on a price with them. Fun fact, I think with one of the drug manufacturers, not us, their initial suggested price was €2. So this is where they start. They say your thing is basically like reading a book, so it's €2. So this is where you're starting. And then it goes into arbitration. And in arbitration they decide alongside someone else, I forgot which actor that is. And then your price is basically given to you. But they're all between 210 and 240, so I don't think anyone's going to manage to go upwards of 250. Yeah.

Interviewer: So since costs for your services basically are reimbursed by insurances, the cost factor is actually not a differentiator for a customer. Right? So I mean, I as a patient, I wouldn't care if the cost is actually 150 or €200 if I have an insurance. Yeah. Okay.

Daphne Petrich: But doctors somehow care a little bit and. Yeah, there's I'm starting to realize a lot of tension because the doctors and the manufacturers, a lot of them are I have to I have another meeting actually. If, if you want an a follow up, if you're interested in anything, just send me any questions you have. And if there's any, like, slides or articles you want, just send it to me and I'll make sure to answer.

Interviewer: Okay, sure. Thank you very much. Thank you. Really a lot. Very nice insights and yeah, thanks a lot. So have a good day. I don't want to hold you.

Daphne Petrich: Thank you. Thank you. Have a great day. Bye.

Interviewer: Thank you. Bye bye.

Appendix 2.3: Interview 3

Interview 3	
Company/ Focus Group	Psychotherapist
Contact Person	Dr. Detlev Schneider
Interview Date and Format of Interview	5th December 2022; Online

Interviewer: Thank you very much. In our master thesis, we are analyzing Business to consumer models in the mental health industry that offer virtual therapy to consumers, such as hellobetter, novego or selfapy. I don´t know whether you have heard of them yet. Within our analysis of the variation of business models within the industry we intentionally kept businesses that focus on mental wellness out of scope, since we aim for a direct comparison with traditional face-to-face therapy. As far as we understood it, those startups offer either fully online therapeutical methods to patients or access to therapists. We aim to understand your view, of the key value delivered to consumers with those platforms, especially in comparison to traditional psychological services. So, thank you for having this interview with us, could you introduce yourself, where you work and what the content of your work is?

Dr. Detlev Schneider: First of all, Sounds like a really interesting research topic. I read a lot about it – especially in the near past. I did not get in touch with the topic of digital mental health in my professional work yet, as it is not necessarily applicable to my patients, however, I can give you my view on the topic.

***Interviewer*:** That's a beginning, thank you!

***Dr. Detlev Schneider*:** Let's start by introducing myself, I am working since 15 years in a psychiatric institution in Hamburg, Ochsenzoll. To give you an idea of my work surrounding: The psychiatry Ochsenzoll is a clinic for people with moderate to severe mental illnesses. Patients get admitted to our clinic and stay for a couple of weeks until many years. We treat mental illness types ranging from addiction, and psychoses to trauma-caused mental illnesses. We also specialized in treating the "hard stuff". Therefore, we also have a dedicated department that holds the highest security standards for sentenced patients. To come to my field of specialization: I hold a doctorate in psychotherapy with a specialization in schizophrenia. My patients have serious levels of this type of mental illness and are typically admitted and very often re-admitted to psychiatric wards, as the suicide threat is comparably high for patients with schizophrenia.

Interviewer: Did you already encounter the topic of digital mental health in detail within your clinic?

Dr. Detlev Schneider: In my direct work environment not yet, no. However, digital mental health is a rising topic as you attend conferences, or get in an exchange with other psychotherapists, which are not directly in my field. Also, we had some discussions around it in the clinic, as we intend to offer the best service quality to our patients.

Interviewer: Ah, interesting, how do you perceive the general view on the topic?

Dr. Detlev Schneider: I have seen one general trend on this topic. The utilization of digital mental health therapies is seen to promote treatment, also predictability, and prevention of the patient's mental illnesses. However, the useful actual potential of digital mental health technologies to enable ongoing treatment is particularly relevant to low-to-moderate cases who are unassessed and untreated, particularly in areas in which mental health resources are under a high degree of stress from serious mental health cases.

Interviewer: Interesting, that was also our view on the topic. In your view, what is the typical customer profile that these services target? And could you imagine integrating some of these technologies into your daily practices?

Dr. Detlev Schneider: Actually, I just read an article about the potential of digital mental health treatments for serious mental illnesses. I can’t tell you exactly what the article stated, but we discussed it earlier this week with colleagues of mine. Our biggest challenge is the re-admission rate of patients with schizophrenia, as our treatments are effective as long as the patient is within our care, however as soon as they are sent out to the real world their symptoms get worse. I can send you the article later. But just to give you some detail – the basic idea was to create a digital community for patients to have an exchange with other patients. We are basically doing this already offline, as we offer group therapy for patients who have recovered from or are currently in the process of getting better. This might only apply to patients who show improvements in their mental health condition at some point, but it is a starting point. We strongly believe in the power of peer support. I believe peer support is an essential tool for people with mental health issues. It gives them the opportunity of feeling like they belong somewhere. I am just not sure about the digitality of the services offered.

Interviewer: What exactly are your concerns with digitality?

Dr. Detlev Schneider: As we treat patients with severe mental illness, the treatment methods might differ from low-to-medium cases. First, the needed level of interaction increases with the severity of the mental illness. It is very hard already to connect with your patients and try to reach them as they sit in the same room as you. This is caused by the facts that most patients live in their own world within their heads. So maybe a community might make sense but replacing traditional therapy with a digital service for severe causes of mental illness is in my view impossible.

Interviewer: Can you give an idea of the value adds for the other stakeholders, such as insurers or therapists?

Dr. Detlev Schneider: I rather see digital tools as an add-on for traditional therapy in severe cases. However, digital therapy, in online courses or whatever can decrease the pressure which is currently on the therapists. There are just not enough therapists available to treat all the patients. For insurers, I can't give you an opinion.

Interviewer: What do you see as enabling factors for the evolvement of new business models in Germany?

Dr. Detlev Schneider: I definitely see the shortage in the number of therapists as one driver for the adaption of digital therapy. And in that case especially for typical mental illnesses such as depression and anxiety. These are also the fields that are best researched as the number of patients is relatively high, therefore effective treatment methods can also be developed for a digital surrounding. Also, we see a steady rise in the number of people with mental illnesses, and this growth is expected to accelerate as general uncertainty increases.

Interviewer: What do you mean by general uncertainty?

Dr. Detlev Schneider: Mental illnesses are linked to the level of uncertainty in a person's life. The more uncertain factors you have in your life the more likely it is to get mentally ill. We have seen this development in the pandemic and currently, inflation and war are increasing this.

Interviewer: Okay understood. What do you see as limitations and disabling factors for the evolvement of new business models in Germany?

Dr. Detlev Schneider: Looking at my field: I already mentioned the limitations arising due to the missing personal interactions. Here I see the largest limitation in the adaptation of digital services. And also, it depends on the age of the patient – digital natives might be more likely to

use digital tools than a 70-year-old man, who just got his first smartphone. Furthermore, in my field, we also work with treatment methods that require physical interaction. Just to give you an example there are treatment ways for severe levels of depression we use Electroconvulsive therapy – which sounds complicated but basically is a psychiatric treatment where a generalized seizure is electrically induced to manage mental disorders. Anna, this is all I can tell you so far. Also, I have a patient appointment in 5 minutes, it was really nice to talk to you I hope that I could give you some insights.

Interviewer: Sure. Thank you very much, it would be nice if your could send me the article later.

Dr. Detlev Schneider: Of course, thank you. Have a great day.

Interviewer: Thank you. Bye bye.

Appendix 2.4: Interview 4

Interview 4	
Company/ Focus Group	Person affected by depression
Contact Person	Anonymous
Interview Date and Format of Interview	5th December 2022; Online

Interviewer: Dear Caro, thank you for the interview, could you briefly introduce yourself?

Anonymous: Hello, I am (anonymous) and I am 26 years old. I was born in Kiel and studied in Hamburg. I have been living in Vienna for a little more than two years and work as a German teacher for adults.

Interviewer: Thank you very much! Would you be so kind as to share your experiences with mental illness?

Anonymous: I wasn't doing so well when I was 17. My parents then referred me to a therapist, a child and adolescent therapist, in other words, a psychotherapist. She had studied medicine as well. And they performed testing, such as IQ tests, to make the diagnosis. They then told me I had minor depression and a maladaptive behavioral condition. That is, when you are unhappy, for example, and it would actually be helping you to go out, for example, or get some fresh air, you tend to do the opposite, which is not helpful, such as crawl into bed. And, yes, exactly.

Interviewer: What was your overall experience with the treatment?

Anonymous: Then I went to therapy with her. It was a talking therapy, behavioural therapy. Um, so we just met once a week and talked. And that actually helped very well. I did that for two years and then it was quite good. But there are always phases when it comes back. After which, I start to feel sad and unmotivated. And then in June 2021, one year and a half prior, I too went through that period. My general practitioner in Vienna then recommended Escitalopram, an antidepressant, which I take in doses of ten milligrams and has shown to be quite effective. However, I initially also wanted to participate in talk therapy since I thought it would benefit me. However, it was exceedingly challenging to locate someone in Vienna, for instance. There are very limited vacancies, and I believe that is also the situation in Germany. That's why I took it, and I'm satisfied with it. I then saw a therapist a couple times after being diagnosed with diabetes. She was a therapist from the hospital who specialized in speaking with diabetic patients. However, she was quite focused with the money, and I didn't get a great impression of her, so that didn't really help. I stopped therapy after that because I didn't see the sense in continuing on. However, if it were simpler to find a spot, I would have already given

it an attempt. In any event, the therapy has always been beneficial. Therefore, from the age of 17 to 19, talk therapy was really beneficial, and I enjoyed seeing and speaking with her in person.

Interviewer: Thank you very much! In our master thesis we analyse business-to-consumer models in the mental health industry that offer virtual therapies to consumers, such as hellobetter, novego or selfapy. As part of our analysis of the different business models within the industry, we have deliberately excluded companies that focus on mental wellness, as we aim to make a direct comparison with traditional face-to-face therapy. As far as we understand, these start-ups offer either fully online therapeutic methods for patients or access to therapists. Where do you see the advantages of online treatment and where do you see disadvantages in taking these treatments online?

Anonymous: The drawback to internet therapy, in my opinion, is that it's never quite as private and that you kind of do it in your own place. I believe doing it at home is not the best option for certain people. Maybe if you also want to discuss about your surroundings, like if you're having issues with your partner, family, or other relationships. Additionally, you can't discuss it as effectively when you first meet online if you live together. And I've always believed that having that journey was important. You have time to digest everything as you go there and return for a half hour. And perhaps after your therapy session at home, you have to get back to work or you're stuck in that same room again. And I think it's actually quite good to do it in a separate room. Maybe a neutral room at the therapist's office. Um, yes, but of course there are also many advantages. So maybe especially for people who have anxiety disorders and so on, who find it difficult to leave the house at all. For them it is certainly a good point that you can do it online. Or if you travel a lot or something, you can always do that. That's very good. Or in times of Covid in any case. Yes, so I would, I could imagine trying it out, because it's so hard to find someone you can meet regularly, I would try it out. But I don't think it can really replace that.

Interviewer: Could you imagine using an app as a support or follow-up to your therapy?

Anonymous: It also says that it can't and shouldn't replace that, but that's why I don't think it would bring me so much benefit to make use of it. And as far as I've seen, it's mostly about the courses that are offered, which I actually find quite interesting. There are also diabetes and depression courses, which would also be interesting for me. And I think you might already know a lot of things, but it's certainly good to read again and I also think it's great that it's paid

for by the health insurance. So I would try it out, but I don't think it would have a great effect on me. That's why it's only an addition or a follow-up solution. But I would much rather wish for something more personal, that maybe you are assigned a therapist there with whom you can really talk and who completely responds to you. Because I found that it often said that you can talk to someone, but it sounds as if it's always just about the course. So how to get them to advise you on how to do the course and how it works and so on.

Interviewer: Were there any group or community exchanges in your therapy? Would you find such an exchange valuable?

Anonymous: There was actually no group and community exchange. My therapist offered that at the time, but I didn't do it. And yes, I think it's actually good in any case. So nowadays I would try it out, but only as an addition, not as a complete replacement. Because I think it's really good in therapy that you can talk personally and be alone with the counsellor. But I would try it out. I hope this has helped you.

Interviewer: Thank you very much!

Appendix 2.5: Interview 5

Interview 5	
Company/ Focus Group	Person affected by Depression
Contact Person	Anonymous
Interview Date and Format of Interview	3rd December 2022; Online

Interviewer: Thank you for having this interview with us, could you briefly introduce yourself?

Anonymous: Sure, I am (anonymous) and I am 68 years old. I grew up in Hamburg, and have a wonderful son, who is already 46. I am retired but have been working for a large retail chain my whole life. But Anna I guess, from what you mentioned last week, that you want to speak about my experience with depression.

Interviewer: Would you be so kind to share your experience with mental illnesses?

Anonymous: Sure, but I would appreciate it if this interview would be kept anonymous. Thank you – you know I don't need everyone to know my story in that level of detail.

Interviewer: Sure, absolutely understandable, no worries.

***Anonymous*:** Anyway, I was sure of some personal issues I needed to address, but it wasn't until a few years ago that I fully understood the scope of my issues. Following the death of my husband in 2013, I went through a depressive time. I had been experiencing a great deal of stress as a result of my recent, extremely painful incident. I wasn't getting any sleep and was getting more and more worried and depressed. I am so appreciative today that my family made me attend to counseling since they were so concerned about me. However, it was such a hard search to find a qualified therapist. After a way too long search for a therapist, I found a psychiatrist, and after the first visit, I had my, well tough, diagnosis. As opposed to what I had anticipated, it was a significant depressive disorder that had been present for some time. Antidepressants were prescribed to me in a low dose to deal with the anxiety. I was taken aback by the prognosis. After the appointment, I immediately contacted my sister because I was so ashamed. What if this medication alters my personality, I recalled asking her. She assured me that this diagnosis had nothing to do with guilt and advised me to look at the bright side of the fact that I now understood what was wrong with me.

Interviewer: First, thank you so much for being so open and honest about your patient history, I highly appreciate it. What kind of treatment did you receive?

Anonymous: I experimented with various antidepressants, ratcheting up their potency over time. I underwent frequent therapy sessions with a therapist and a psychiatrist for three years, as well as group therapy.

Interviewer: Overall, what was your experience with the treatment?

Anonymous: Mixed, as I really struggled at the beginning. As an independent woman I felt as though my declining health I would have nothing positive to look forward to. I did not want to become dependent on others. Ans especially I did not want to feel like a burden to my family. However, the treatment has been very effective, and I was surprised how fast I could go back to my normal life. Currently, I rely on medication, and I am grateful to have it because I know it has really helped me. At the same time, I balance the wish that I could be free of it with the fear that it might lead to a relapse. The scariest thing about my whole recovery process is that the only person who can truly help me is myself. I have learned to change my thought patterns and stop criticizing myself hardly, it's a habit that's been hard to overcome but I know I've made some positive changes. If I was to give one piece of advice to others who are struggling, it would be not to suffer in silence, but to open yourself up to others.

Interviewer: In our master thesis, we are analyzing business to consumer models in the mental health industry that offer virtual therapy to consumers, such as hellobetter, novego or selfapy. Within our analysis of the variation of business models within the industry we intentionally kept businesses that focus on mental wellness out of scope, since we aim for a direct comparison with traditional face-to-face therapy. As far as we understood it, those startups offer either fully online therapeutical methods to patients or access to therapists. Where would you see advantages in receiving these treatments online?

Anonymous: The biggest challenge for me was to actually find a therapist – so if you can receive access to therapy faster this would be a major advantage. But I would be curious to understand how they offer therapy – I mean I would not always have to drive to my therapist which takes me over thirty minutes every time.

Interviewer: Where would you see disadvantages in receiving these treatments online?

Anonymous: I build a strong relationship with my therapist over the years, and I would not want to miss out on that.

Interviewer: Could you imagine using an app as an add-on or follow-up in your therapy?

Anonymous: Actually, I would love that! I aimed to reduce my frequency of going to therapy. However, I am still scared of unpredictable relapses, so I continue to go to my therapy.

Interviewer: So, you mentioned that your therapy incorporates group or community exchange? Did you perceive such an exchange as valuable?

Anonymous: Yes! Before I have an opinion about a course of treatment, I'm willing to try everything. Actually, when I began group therapy, I was really apprehensive about addressing personal matters in public, especially with individuals I had never met before. Despite this, I discovered the group to be a very safe space that allowed me to let my guard down and be open with people who had similar difficulties to mine and still do. It felt so fantastic to converse with others who shared my ideas. After the group experience, I am more reflective, able to manage my negative thoughts and take a breath before responding. I am also more at ease.

Interviewer: Thank you so so much for your time (anonymous)! These were all the questions we had. I highly appreciate your openness and I am happy to see you soon! Bye.

Anonymous: It was great to talk to you. Bye. Bye.

Interviewer: Thank you again bye.

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