

USER-FOCUSED IDEATION AND DESIGN: GINGER.IO

“To really move the needle and change the way that healthcare is delivered for behavioral health and increased access, the human component and human touch is critical.”¹

– Omar Dawood, Medical Director, Ginger.io 2016 - 2019

Ginger.io was founded by MIT researchers Anmol Madan and Karan Singh to address the toll of stress, anxiety, and depression on people’s everyday lives. The pair met at MIT’s Media Lab, where Madan’s research focused on tracking data from students’ mobile devices to identify illness. Together, they envisioned better ways to use such approaches to treat mental health conditions. Ultimately, by staying focused on the needs of their users, they succeeded in making mental health care more effective, accessible, and affordable to hundreds of thousands of users.

Background

Before he co-founded Ginger.io, Anmol Madan was a researcher at the MIT Media Lab. There, he collaborated with Dr. Alexander Pentland and researchers at MIT’s Human Dynamics Lab to study reality mining; the collection and analysis of human behavior data generated by monitoring technology usage. Specifically, by examining the passive digital footprint created by mobile phone usage, the researchers could identify predictable patterns and draw conclusions about what people do, where they go, and with whom they communicate.

When this research also yielded findings about how people with depression behave when they are symptomatic, Madan became intrigued with the idea of applying these techniques to a wide range of disease areas from diabetes to mental health. The premise was that behavioral data gleaned from smartphones, such as movement, location, and call and text frequency and duration, could be used to establish a baseline, or normal behavioral pattern for an individual. Significant deviations from that baseline could, in turn, indicate the onset of symptoms. “If someone is depressed, for instance, they isolate themselves, have a hard time getting up to go to school or work, they’re lethargic and don’t like communicating with others the way they typically do,” Madan explained. “Turns out, you see those same features change in their mobile phone sensor data in their movement, [usage], and interactions with others.”²

By passively monitoring this flow of information, Madan believed it would be possible to detect when patients were experiencing warning signs and symptoms of an underlying condition and then trigger an alert to help patients or providers take preventative measures or begin prompt treatment. In this way, “big data” analytics could be used to move care delivery towards earlier, less time and resource-intensive interventions. “Acting on that information while it’s still the right time, when patients can correct their behavior, could certainly change the way we deliver care,” Madan said.³ He recruited Karan Singh, also at MIT, as a co-founder, and the pair began researching needs that could potentially benefit from this capability.

Researching and Validating the Need

After extensive research, the founders ultimately gravitated toward needs in the field of behavioral and mental health. For one thing, the mental health market was huge. Mental illness affects millions of individuals in the US every year. Annually, an estimated 43.8 million US adults, about 1 in 5, experience some sort of mental health issue.⁴ However, access to mental health treatment is limited and patients remain significantly underserved. Despite the pervasive incidence of mental illness and the massive costs associated with treatment, 56 percent of adults suffering from mental health issues receive insufficient care, or no care at all.⁵ Barriers includes a significant shortage of mental healthcare providers,⁶ as well as cost, distance to the nearest clinic, or other similar obstacles.

Coming Up with the Right Solution

Although the need was clear, Madan and Singh's vision for an effective solution was initially less certain. However, based on what they had learned, they were able to come up with a handful of critical need criteria that would ultimately help them guide ideation and solution design.

The first must-have criterion was directly related to the population they were focused on serving: people with an underlying mental health concern who wanted help managing their wellness over time.⁷ The founders believed that individuals in this population were not especially attentive to the physical or emotional warning signs that could indicate a mental health issue, so they would benefit from a "human check engine light"⁸ to alert them to key signals. Because most people aren't particularly motivated to make major behavior changes to monitor their wellness,⁹ any solution would have to be unobtrusive and easily integrated into their normal patterns and routines.

Another important criterion was ensuring privacy for the individual seeking help. "Talking about depression remains a challenge," said Madan.¹⁰ In speaking with physicians, therapists, and especially patients, the founders observed a perceived stigma around mental health that made some individuals reticent to raise concerns or share their symptoms. The Ginger.io solution needed to be discreet, secure, and confidential.

Similarly, the founding team recognized that their solution had to make care available around the clock, whenever the user needed it. "There's a complete mismatch right now in terms of care and resources," said Omar Dawood, who became Ginger.io's medical director. "Symptoms are completely unscheduled whereas care is scheduled. And those two don't go well together."

Finally, Madan and Singh wanted to design a solution that would make care both more affordable and more broadly accessible. This is where their strong technical expertise would be essential. "We cannot train enough psychiatrists or hire enough therapists to ensure access to high-quality care without technology playing an important role," Madan said.¹¹

With these parameters to guide them, the founders undertook a human-centered ideation and design process that ultimately led to the creation of Ginger.io's first consumer product. By focusing on a smart phone app they found they were able to take advantage of Madan's original research and also address their other must-have need criteria. After downloading the app, patients would start by filling out a short questionnaire to provide information about their conditions, past and current treatment, medication use, and healthcare provider(s). The app would then begin passively collecting millions of data points around cell phone usage.

After recording several days of typical use patterns, the algorithms looked for significant deviations and then responded by sending a text to the user and/or the specified family member, friend, or healthcare provider to alert them to a potential problem. "When they get the alert, they call and see what's really

going on. Then, they make that decision of having the patient come in to see a doctor or handle the issue over the phone,” Dawood explained.

He continued, “The initial concept was to develop the world’s best behavioral health analytics engine, leveraging it with the most ubiquitous sensor that we have around us, which is the smart phone. There are so many different, isolated actions that one takes with a smart phone that are not content related... when you combine them and then match them up against billions of other data forms collected from the population, you can make patient-specific insights.”

According to Jeremy Johnson, Ginger.io’s head of engineering, delivering their service through an app created some additional user-centered design challenges for the team as they conceptualized their solution. For instance, he noted, they knew they would be competing for user attention against “...every other mobile app that a user is likely to [open],” including social media sites. To address this, the team worked hard to design a technology that ran effortlessly in the background, rather than requiring frequent input from the user. The passive nature of their tracking algorithm was a benefit in this regard, and they were able to build upon this by automating alerts and other important features.

Another important design consideration, one that all digital health companies must contend with, was whether or not the Ginger.io team was developing a solution that would be considered a medical device by the US Food and Drug Administration (FDA). Apps that claim to prevent, diagnose, or treat specific diseases or conditions are generally considered medical devices and are, therefore, subject to regulation by the FDA. In contrast, those that focus on gathering and assessing data to provide guidance or coaching (rather than diagnosis or treatment) may be exempt from regulatory requirements.

To help them choose the appropriate path, the Ginger.io team carefully evaluated the core functionality they were most passionate about providing to their target users; alerting them to the potential need for care. Given this focus, they determined that they would not meet the FDA’s guidelines for classification as a medical device. While this decision eliminated certain regulatory hurdles, it simultaneously imposed design constraints on the team to ensure that the app would not overextend in any way to diagnosis or treatment. As Dawood put it, “We needed to stay outside the bounds of being a medical device, so the product and our messaging is explicitly designed that way.”

Need ... and Solution ... Evolution

Roughly four years after initial launch, Ginger.io had established a strong user base and was making meaningful strides towards its mission. However, through feedback from its users, the team recognized that they could be doing more to improve mental health management for their community. “Technology in itself cannot change medicine,” said Dawood. “We had to go back to something that we have centuries of data on in behavioral health, which is the human touch.” For instance, many users already had mental health providers they could engage when they became symptomatic, but others did not and would benefit from assistance in finding someone appropriate to help. As Madan described, “In our drive to improve care and accessibility for patients with depression and anxiety, we...recognize the fundamental importance and value of trained mental-health professionals...from primary-care providers and psychiatrists prescribing medications, to therapists and behavioral coaches.... The challenge we faced was how to include human care in a scalable manner.”¹²

Ultimately, the team implemented a collaborative care model, where every user is matched with a personal health coach. “Having a trusted relationship at the core of what we do has become critical,” Dawood said. The coach serves as a central source of information and a personalized care planner, linking patients to experienced mental health clinicians such as licensed therapists and medical providers

as needed. “[The health coach] is able to connect a patient to the right sort of health-care provider at the right time, thus playing a pivotal role in balancing patient needs with available resources,” described Madan.¹³ Concurrently, in-application activities based on clinically-validated strategies such as cognitive-behavioral therapy and mindfulness help individuals better manage their own mental health.

According to Dawood, the addition of human coaches to the offering represents the natural evolution of the product, while also helping better fulfill the team’s original must-have criteria. For example, care is available exactly when it is needed. “The coach can elevate people to different levels of care, from licensed therapy to board-certified psychiatry, exactly when the user needs it. Not two weeks from now, not tomorrow, but right now, exactly when your symptoms demand it,” he said.

Ginger.io was able to reach hundreds of thousands of users seeking to more effectively manage their mental health. Importantly, Ginger.io’s combination of technology and human-centered care has elevated the effectiveness mental health management by eliminating a chief problem in the field: the reliance on patient-reported outcomes (PROs). Explained Jon Callaghan, an early investor in the company, “PROs [have been] the standard collection method for obtaining information about patient mental, physical, and social health status, and are used to assess risk, aid in clinical decision-making, and serve as endpoints in clinical research for the discovery of new therapies. Despite their importance, PROs are burdensome, incomplete, and biased, compromising clinical research and care decisions.”¹⁴ In other words, healthcare insights drawn from objective data are more reliable and valuable. “With our data collection, it’s like having the psychiatrist sitting in the patient’s living room at all times being able to collect contextual information,” said Dawood.

In 2019, Ginger.io merged with Headspace, a global leader in mindfulness and meditation, to form Headspace Health. Headspace Health provides an even broader array of mental health solutions centered around a digital health experience.

Key Insights

- **Even when research/technology gives you an idea, the need still matters!**
“Don’t start with a solution. Start with a problem and start by understanding why that problem is a problem. Then you can start looking at plugging in how mobile or other technologies can fit into that. Too many times, entrepreneurs run with a solution before they have truly understood what the problem is.”
–Omar Dawood
- **Winning solutions are optimized for a target user**
When developing a mobile app, the key is to optimize it around what the user needs, not just what the technology can do. Establish real empathy for your users and design a solution with functionality and features that will delight them.
- **Users and their needs will evolve...and your solution must change with them**
Just as Ginger.io shifted from a mobile monitoring platform to an integrated mental health approach, digital health companies should be ready to adapt to keep pace with the evolving needs of their users.

¹ All quotations are from interviews conducted by the authors unless otherwise cited.

² Rob Matheson, "Mental Health Monitoring Goes Mobile," MIT News, July 16, 2014, <http://news.mit.edu/2014/mental-health-monitoring-goes-mobile-0716> (July 12, 2022).

³ Ibid.

⁴ "Mental Health By the Numbers," National Alliance on Mental Illness, <https://www.nami.org/Learn-More/Mental-Health-By-the-Numbers> (July 12, 2022).

⁵ Ibid.

⁶ Lousie Radnofsky, "Where Are the Mental Health Providers?" The Wall Street Journal, February 16, 2015, <https://www.wsj.com/articles/where-are-the-mental-health-providers-1424145646> (July 12, 2022).

⁷ Brian Edwards, "Why Ginger.io is the Most Innovative Digital Health Startup," imedicalapps.com, July 18, 2012, <https://www.imedicalapps.com/2012/07/ginger-io-digital-health-startup/> (July 12, 2022).

⁸ Ibid.

⁹ Ibid.

¹⁰ Anmol Madan, "Your Smartphone, Your Therapist?" Huffington Post Blog, http://www.huffingtonpost.com/anmol-madan/your-smartphone-your-therapist_b_9054156.html (July 12, 2022).

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ Jon Callaghan, "Disrupting Health Care with Ginger.io," True Ventures.com, November 28, 2012, <https://trueventures.com/disrupting-health-care-with-ginger-io/> (July 12, 2022).