Interview: Nawal Roy – Founder & CEO, Holmusk, Singapore (November 2016)

"Healthcare is still in the early stages of convergence with technology, but there will be sweeping changes across the entire vertical in the next 10 years"

15.11.2016

Tags: Singapore, Holmusk, Digital Health, Digitalization, Preventative Healthcare, Healthcare, Chronic Disease

Recently established in Singapore, Holmusk is a global digital health platform that truly believes in early detection and early intervention. Founder and CEO Nawal Roy describes the underlying motivations behind the company's founding, the value of positively influencing patient behavior—particularly in tackling chronic diseases—, and how their technology benefits not only patients, but all stakeholders.

What were the initial aspirations behind the creation of Holmusk?

After having spent 15 years in finance, I've seen first hand the transformational impact that information and technology can have on a given sector. Healthcare is still in the early stages of convergence with technology, but there will be sweeping changes across the entire vertical in the next 10 years. That was essentially my high level starting point when initially entering this space.

Sometime in 2015, I remember reading an article in the Economist that highlighted for the first time in human history, more people died from non- communicable diseases than infectious diseases. This statement underscores our massive failing as a society, in which more humans are now dying from man-made diseases and, by extension, the lifestyle choices they make.

I then spent a significant amount of time studying the sector and essentially determined that the path to curing a given chronic disease is guided by three basic principles: medicine, lifestyle, and

adherence to both. Currently, the entire healthcare architecture as we know has been built to largely revolve around the medicinal portion of intervention, and increasingly adherence to the treatments.

But in order to truly influence patient outcomes, the latter portion is absolutely critical—maintaining a healthy lifestyle and adherence to this routine—and this is what we built Holmusk to help patients achieve.

How has far has the company evolved since its founding?

The company was launched in February 2015, and it took us seven months to build our first product, GlycoLeap, a B2B2C mobile-based, end-to-end engagement tool to help patients suffering from diabetes adopt positive behaviors and effectively manage the chronic disease. We beta tested the platform from September 2015 to July 2016, and now it’s at the precursor of taking in the masses of users.

Although we’re starting with diabetes, our intent is to eventually focus on every chronic disease.

Even though we’re only 18 months old, we’ve already acquired a company named MindLinc in the US, with full operational capacities and a 15-person team, and have also established an office in Malaysia, in addition to Singapore. We’re still structuring our business model, but we hope to ultimately partner with employers, insurers, pharma companies, and even the healthcare providers themselves.

Influencing and ultimately changing patients’ lifestyle choices is more an exercise in psychology than chemistry. How can big data help? What type of actionable insight can it produce?

The data that we capture spans both health data and psychological engagement data. The latter assesses how engaged the patient is and in what ways we can improve these levels.

With current standards of care, patients go to the doctor once, with the next visit probably anywhere from three to six months down the line. The patients’ behavior within that time frame is not tracked nor known to the healthcare practitioner. Doctors also don’t particularly have the means or capacity to constantly urge all of their patients to maintain treatment compliance or consistently encourage healthy lifestyle choices.

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We've constructed a mobile application with inherent mechanisms to facilitate continuous engagement with the patient. This includes built-in goal setting and milestone techniques, tracking of food habits, the ability to measure sugar content of meals by simply snapping a picture, and even a weighing scale that automatically stores data on the cloud. We also send customers a glucometer to effectively monitor glucose levels, and have master API technology that enables us to extract data from 200 different sensors. Essentially, there are more than 20 different data inflection points that we collect and combine to produce a single index that tracks engagement.

There seems to be a lot of ways to influence positive patient behavior, but how do you go about incentivizing initial adoption?

On the B2C side, we employ a high degree of selection bias. We look for a set of patients that are committed to change. We use every filter to not necessarily appeal to everyone, and are thus optimizing the effectiveness of the people who sign up for the program.

In Singapore, for example, there are close to 450,000 diabetic patients, with another 450,000 that are pre--diabetic at the time of writing. Our goal is to meaningfully impact the lives of 50,000 people in the next three years. No program can work for a patient that has no desire to change, as this is a fully non-medication paradigm. We have implemented multiple layers of persona and trigger analysis, and there is a massive degree of consumer behavior science operating in the backend, but deployed through a tech platform so we can eventually scale up efficiently and effectively.

How can payers, companies, and even governments benefit from partnering with Holmusk?

As of now, in terms of non-communicable diseases, pharma companies only cater to patients when they become chronic—the real market is outside of this stage. But even at the point of medicinal intervention, there's no way for these companies to stay engaged with the patient after treatment.

Though, companies like Novo Nordisk have made significant strides in targeting early stages of chronic disease to encourage early intervention and even prevention. We would love to figure out which partnership opportunities exist with these types of companies and determine how best our analytical tools can help further their efforts downstream.

For a product like this, the science is not a challenge—getting it reimbursed and paid for is. At a disease level, insurance companies will profile you as either diabetic or non--diabetic. Once determined to be diabetic, you are placed in this bucket for the rest of your life and the premiums

increase accordingly. The reality, however, is not this bipolar; of course there are diabetics and non-- diabetics, but there's also a big subset of the population that are "controlled diabetes," people who have the disease properly managed and in check.

From a healthcare point of view, the discussion revolves around how policies can ***incentivize*** early intervention to prevent diabetic patients from crowding hospitals, while also enabling more remote engagement. Currently, patients have access to therapeutic solutions as long as they have access to doctors; whereas, this tool can be deployed anywhere, regardless of physical proximity to the nearest healthcare facility. Technologies such as the one we employ have the potential to yield a complete paradigm shift in how we as a society approach healthcare.

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How will you go about allocating your resources among these different channels?

The volume will come from B2B. Having said that, you can never discount the B2C component in Asia. We're targeting 50,000 out of 900,000 people in Singapore—quite literally less than 10 percent of total diabetic population. No one has tried to capture the market from that point of view. We aim to ***meaningfully*** change the lives of 50,000 patients in the next three years, and only then will we consider ourselves successful.

At a B2B level, we lose the selection bias. But what works is the solution makes changes of patient's daily routine habits in the most engaging way. In an ideal scenario where all 900,000 patients have signed up, we find that 17 – 24 percent of the population will be highly engaged—where the app will be the most effective. 35 percent of the population will be partially engaged, with the same level of efficacy but only at a 50 percent probability. The remaining percentage will not be engaged, and there's nothing we can do about them. But from a purely macro point of view, it only takes 9 percent of the population to yield an ROI.

The success of a mobile platform is only contingent on countries with high mobile penetration rates. What happens when you bring the discussion to say, parts of rural India, where telecoms and smartphone adoption rates aren't as developed and widespread?

Aside from the fact that diabetes is generally an urban-centric disease, our focus is primarily on determining whether or not our platform will work with a very small set of the population first. For the next two to three years time, our central priority is not on developing a mass--market product,

but specialized solution completely unique to what is already offered in the industry.

Currently, the first and foremost solution for any major chronic disease is visiting a doctor. But it doesn’t necessarily need to be the case, and that’s what we’re aiming to change.

What conceivable applications do you envision for the company’s technology in the future?

Our next disease buckets are very likely to be cardiovascular and mental health (i.e. depression), particularly given their high correlations with diabetes.

We are currently working with SingHealth—the largest hospital care provider in the country—to analyze a whole repository of cardiovascular data, hoping to extract meaningful insights and ultimately determine the most effective intervention model from a patient behavior standpoint.

Secondly, we’ve recently acquired MindLinc, a comprehensive mental health database developed by Duke University. This gives us an unparalleled level of behavioral insight for patients suffering from mental illnesses such as depression.

In the next three to five years, we’re hoping to extend our capabilities to all chronic, non---communicable diseases outside of cancer, including CVD, COPD, hypertension, etc.

As the company continues to scale up, how will it go about maintaining a unique value proposition against the multitude of traditional and non-traditional competitors entering this arena such as, Apple, Google, and IBM?

Firstly, the giants in the industry would normally prefer to acquire our company, rather than build their platform from scratch and compete head on.

Secondly, when tackling society--wide challenges, large--scale companies provide large--scale solutions, with investments culminating around the USD 500 million mark as opposed to USD 15 million. Holmusk is addressing the issue in a much more granular manner—a minute scale that wouldn’t normally be of interest to the behemoths.

I don’t fear large companies entering this specific niche; and if anything, it would just further validate our approach, the seriousness of the disease, and our business model—a tailwind for what we are doing, rather than competition.

But 10 – 15 years down the line this market segment will likely become a very competitive segment, and of course, we want to be the frontrunner.

Speaking more towards your entrepreneurial journey, what were some of the benefits in building a healthcare startup in Singapore?

I find that Singapore is one of the easiest places to do business, with high caliber talent, an extremely business savvy government, and also forthcoming immigration policies. Sourcing global talent from the very beginning, we have been able to hire people from 15 different countries.

The challenge in Singapore is the market size. So if you want to be a single-market player, certainly there is no advantage here. However, Singapore can be the perfect lab to pilot new technologies and concepts. Certainly, the commercial prospects in markets like China, India, and the United States are much higher, but the probability of launch failure are significantly greater as well—but that's the trade off you get.

As the founder of the company, how will you ultimately measure your success moving forward?

My personal goal is to make Holmusk a successful, capital-efficient business by 2018, with the ambition to run this company for the rest of my life; though that's not to say I wouldn't consider M&A opportunities.

We would consider ourselves to be extremely successful if we're capturing at least three disease buckets—namely diabetes, cardiovascular, and depression, with a footprint in six different countries and 200 to 250 people on staff.

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