FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter

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Table of Contents

Wearables

Microsoft patent shows wearable band with haptic feedback – December 17, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device + Sensors)	**Therapeutic Areas**	Lifestyle Monitoring, Rehabilitation
Applications	Remote Patient Monitoring	**Geographic Focus**	US/ Global
Segment Focus	Consumer/ Clinical Grade	**Topics (News type)**	Competitive Intelligence
Companies	Microsoft	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Microsoft has filed a new patent for a wearable device with actuators. The company did exit the wearable market after Microsoft Band 2 but it looks like they just took a break to develop a better wearable device.
- **Industry Needs:** When it comes to wearables technologies and healthcare, strong customer demand and surging sales are only part of the story. The other part is the highly volatile marketplace, where due to intense competition there is a revolving door of company entries and exits. For example, the case of Microsoft discontinuing its Band fitness tracker. This makes industry experts believe that healthcare wearable technologies are approaching a tipping point that will elevate the focus from fitness or activity tracking devices to clinically vetted devices with intelligence solutions for meaningful health use cases.

Microsoft patent shows wearable band with haptic feedback – December 17, 2018 (2/2)

- **Value Proposition:** Microsoft's latest patent application shows the company has worked on a wearable band that would wrap around limbs or joints and use haptic feedback for therapeutic stimulation. Microsoft's wearable wouldn't count steps or measure heart rates, but rather is designed to alleviate symptoms of conditions that affect a person's ability to move or control limbs, such as tremors or stiff muscles caused by Parkinson's disease.
- According to the patent, the device would have many haptic actuators distributed across a band that can be adjusted in terms of each actuator's "duty cycle" in response to sensor data'.
- The patent titled "WEARABLE DEVICE" was filed by Microsoft in June 2017 and was published by USPTO 14th Dec. What does the patent say? *"Haptic stimulation systems apply forces or vibrations to stimulate a user's sense of touch. Touch-screen devices may use haptic feedback to indicate key presses to a user; games controllers may use haptic feedback to increase video game immersion (e.g. by vibrating in response to a collision or explosion within a video game) and smart watches may use haptic feedback to provide silent alerts to the wearer."* (by Microsoft).

- Though the exact device specifications and application still remain unknown, Frost & Sullivan anticipates this as a possible come-back of Microsoft in the healthcare wearable space with more focused solutions that may help reduce conditions such as Parkinson's among others. As per the company, to improve the effectiveness of the device, it would be possible to selectively activate a portion of the actuators to suit the wearer's unique needs. Alternatively, the wearable could be designed with movable actuators to target the area of the limb experiencing involuntary motion.

- **Target End-User:** Healthcare Consumers, Pharma Clinical trials, Academic Research Organizations

WEBLINK: https://zd.net/2RbCFOC

AI-Driven Wearable Heart Monitor to Prevent Heart Disease and Stroke – December 18, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device + App)	**Therapeutic Areas**	Cardiac Care
Applications	Remote Patient Monitoring	**Geographic Focus**	UK / Global
Segment Focus	Consumer/ Clinical Grade	**Topics (News type)**	Competitive Intelligence, Technology Innovation
Companies	Heartwear	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Cambridge Heartwear, a medical provider of low-cost, next-generation wearable heart monitors that uses artificial intelligence (AI) to diagnose heart rhythm and respiratory problems in real time, is announcing the launch of their company and release of their Heartsense monitor in 2019.
- **Industry Need:** Heart disease has been the biggest killer in America since 1920 and involves spending of more than $110 billion/year. National and international data suggests that more than 80 percent of those who die or who are left with severe neurological deficits following a stroke had an irregular heartbeat as the underlying cause. Among this, Atrial Fibrillation (AF) is the most common heart rhythm abnormality and about 1 in every 4 people aged 40+ years are at risk of developing AF. Given that it often has silent symptoms and goes undetected, the healthcare industry has been exploring novel wearables that continue to demonstrate tangible results in promoting preventive care.

AI-Driven Wearable Heart Monitor to Prevent Heart Disease and Stroke – December 18, 2018 (2/2)

- **Value Proposition:** As per the company, unlike majority of the wearables in the market that originated from a "product first, healthcare second' approach, the Heartsense monitor was born out of real-life clinical practice. Cambridge Heartwear's Heartsense monitor is a wirelessly chargeable heart health device on the market that uses real-time, pulse oximetry and multiple ECG inputs. When using the device, patients control and own their own heart data. Patients can also allow the device to securely acquire and transmit their real-time data to their physician. The platform allows patient's data to be shared with physicians the moment activity is started.
- The Cambridge Heartsense monitor is already undergoing clinical trials among top-tier athletic organizations in the UK and the US. It recently featured on PwC's List of Most Innovative and Disruptive New Companies in the UK. The company is also providing Heartsense monitors to communities in India and Africa to help prevent heart disease and stroke among patients. The device will be available on the market in early 2019.
- Frost & Sullivan finds the AI value proposition of Heartsense monitor interesting to provide intelligent decision making for patient and their care providers. However, Frost & Sullivan also notes that the cardiac wearable or remote monitoring solutions space is already crowded with big names such as; BioTelemetry, Inc. (Cardionet, Lifewatch) , iRhythm Technologies, Bardy Diagnostics, Inc., and AliveCore among others.
- Moving forward, it will be interesting to watch how Cambridge Heartsense monitor will differentiate its market positioning and fair against existing competition.

- **Target End-User:** Healthcare Consumers, Pharma Clinical trials, Academic Research Organizations

WEBLINK: https://bit.ly/2S2mznG

Mobile Phones/ mHealth

Concepta Diagnostics launches new tool to track ovulation – December 19, 2018 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	mHealth App	**Therapeutic Areas**	Women's Health and Fertility
Applications	Companion mHealth app with fertility test kits	**Geographic Focus**	UK
Segment Focus	Consumer Grade	**Topics (News type)**	Care Delivery Innovation
Companies	Concepta Diagnostics	**Others**	-

ANALYST TAKE:

Synopsis: Concepta Diagnostics, the UK based women's health company, unveiled its myLotus Fertility app and monitoring system, which lets women track their ovulation cycle based on periodic monitoring of luteinizing hormone (LH) levels through its dipstick based monitoring system

Industry Need

- Infertility has been a growing concern, especially among developed nations, owing to their busy lifestyles, higher stress levels and a general refrain from women to bear children until a certain age.
- As per the CDC, around 12% of women aged 15 to 44 years in the US have difficulty getting pregnant. Similarly, as per NHS, in the UK, 1 in 7 couples or around 3.5 million people have difficulty conceiving a child.

Concepta Diagnostics launches new tool to track ovulation – December 19, 2018 (2/2)

Value Proposition:

- The myLotus fertility system consists of a dipstick based urine monitoring system which measures the level of LH, the universally accepted indicator of impending ovulation, in the women urine samples.
- The monitoring system is combined with the myLotus fertility app, which helps track fertile days, could also be used as a standalone fertility tracker. The app has capabilities to prompt the user to do an LH test based on the period data entered. For the first cycle, the user needs to do the LH test every day until there is a "surge" in LH levels. After the first cycle the system claims to be capable of personalizing the user's hormone profile and calculate testing days for ovulation. The system also has the capability to help women detect if they're pregnant.
- Frost & Sullivan research finds that women's health, fertility and pregnancy are popular digital health categories, with a number of companies coming up with innovative value propositions for their products. Almost all the innovations leverage the smartphone's ubiquity. The latest example of the innovation happening in this space is an AI enabled smartphone based test, being developed by investigators at Brigham And Women's Hospital, which tracks ovulation through automatic detection of fern patterns — a marker of ovulation — in the women's saliva samples. While other companies such as Mira and Ava already have their own at-home fertility solutions, some companies like Natural Cycles, which measures the women's fertile period based on basal body temperature inputs, have positioned their app as an effective digital contraceptive. The Mira and Natural Cycles solutions are FDA and CE cleared, which while adding a clinical dimension to these offerings with an added advantage of trust and credibility, also comes with regulatory challenges regarding marketing and labeling a medical device based on its intended use and the complications related to strict prescription based usage.

- **Target End-User:** Women

WEBLINK: https://bit.ly/2AaAz7N

Uganda's first AI lab launches a malaria detecting smartphone app – December 14, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth App, Artificial Intelligence	**Therapeutic Areas**	Malaria
Applications	Smartphone camera and AI enabled image assessment algorithm	**Geographic Focus**	Uganda
Segment Focus	Clinical/ Consumer Grade	**Topics (News type)**	Tech Innovation
Companies	Makerere University AI Lab	**Others**	-

ANALYST TAKE:

- **Synopsis:** Uganda's Makerere University has developed a smartphone AI based algorithm which leverages a smartphone clamped over a microscope eyepiece to detect and highlight the presence of malaria parasite in patient blood samples.
- The solution, being the first indigenous of Uganda, would enable a positive diagnosis of malaria in around 2-3 minutes as opposed to 30 minutes time being taken by an experienced pathologist.
- Frost & Sullivan research finds that, while this is not the first smartphone based diagnostic test for diagnosing malaria, it is one of the first AI based solutions to detect malaria. We also came across a few initiatives by IBM and Insilico Medicine, which have been leveraging AI to combat malaria in under developed regions. While the former is using advanced computer infrastructure and AI to device high performing future intervention and prevention strategies based on a particular regional characteristics, the latter has been leveraging AI in malaria related drug discovery.

WEBLINK: https://cnn.it/2R46UXJ

Smart Home Devices & Appliances

Alexa's latest skill helps patients manage high blood pressure – December 12, 2018 (1/2)

Applicable Product Categories: Voice Assistants / Bixby

Technologies	IoT & more	**Therapeutic Areas**	Blood Pressure
Applications	Voice Assistants	**Geographic Focus**	US / Global
Segment Focus	Clinical Grade	**Topics (News type)**	Other Trends
Companies	Amazon & Omron	**Others**	-

ANALYST TAKE:

- **Synopsis:** Omron has released a new Alexa skill for patients to monitor blood pressure with Omron devices and use voice commands for support.

- **Industry Needs:** An estimated 75 million Americans have high blood pressure (about 1 in 3 US adults). Almost half (46%) of these adults don't have their blood pressure under control. This (high blood pressure) costs $48.6 billion to the US healthcare system annually, with blood pressure being the primary of contributing factor to 410,000 deaths in 2014 (over 1,100 deaths everyday). The rise of home health monitoring and remote patient monitoring has resulted in the uptake of home use blood pressure monitoring devices, an area where Omron is a global leader. The devices though accurate, are only useful when used – Omron now has a string of connected devices (IoT) that can provide digital data as well as help with medication adherence. Voice interface can enhance the usability of these devices.

Alexa's latest skill helps patients manage high blood pressure – December 12, 2018 (2/2)

- **Value Proposition:**
- "In addition to giving users their blood pressure statistics in real time, the new skill will also enable the use of the digital assistant for reminders, average daily blood pressure readings, and flags for blood pressure readings that are higher than usual. Patients can also have Alexa remind them to take their blood pressure in the event that they forget frequently."
- "Last year, Amazon worked with pharmaceutical giant Merck to offer a prize to developers building Alexa skills to help people with diabetes. This year, the company also worked with a company called Arcadia group to offer an exclusive lineup of home health products, branded as Choice, that includes blood pressure and blood glucose monitors. However, the Omron skill is believed to be the first Alexa skill that works directly in conjunction with a blood pressure monitor."

- Frost & Sullivan holds voice interfaces in high regard, primarily due to their ability to enhance ease of 'use' of other products and services. The elderly population may not necessarily be comfortable with touch screen interfaces (tablets or phones), but a natural language voice interface maybe more user friendly. [Though Frost also believes in providing supplementary touch-screen support for specific populations such as the disabled, or for those times when natural language processing is not evolved enough to pick up on the intended user command.] Until we don't have continuous blood pressure monitoring devices (Omron is working on such a wearable, along with others as covered in previous issues' wearables section), the ability to remind high-risk patients with a voice interface (versus a smartphone app reminder) may prove to be useful. However, research studies may need to be undertaken to prove the imrpoved efficacy of reminders when deliverd over a voice interface versus a phone app reminder. Nevertheless, the added voice interface skill is a great value-added feature from a patient experience and convenience point of view.

- **Target End-User:** High blood pressure patients, Health insurers, health systems / ACOs.

WEBLINK: https://bit.ly/2GA94dt

National, regional or global? Orange highlights the strategic dilemma facing CSPs – December 17, 2018

Applicable Product Categories: Smart Speakers

Technologies	IoT & more	**Therapeutic Areas**	-
Applications	Voice Assistants	**Geographic Focus**	EU / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Competitive Intelligence, Other Trends
Companies	Orange	**Others**	Deutsche Telekom, Amazon

ANALYST TAKE:

- **Synopsis:** Communication service provider, Orange, launched an AI initiative, the Djingo smart speaker for the connected home, announced a partnership with Deutsche Telekom to create “a Digital Europe” (for DT’s identical smart speaker called Hello Magenta), and also with Amazon for access to Alexa.

- Frost & Sullivan views telecom service providers as a major player in the connected home space, and expects more global players to make their foray in this area. Healthcare in the connected home will also be on their agenda . Deutsche Telekom for example, already offers QIVICON, an open, connected home platform, offered as a white-labeled solution, and enables assisted living / aging-in-place and telemedicine services among other things. Telecom service providers form ideal partners to gain entry to the smart home with healthcare services.

WEBLINK: https://bit.ly/2PRxXAS

Other Interesting Articles

When available, other interesting articles will be covered here in short.

News Title	Link	Remarks
Amazon's three-pronged plan for taking over your home	https://bit.ly/2CrgCLL	A great insight in to Amazon's strategy for smart home market, their vision for the future and challenges, especially around how they have a lead over peers in this space.
The Coming Commodification of Life at Home	https://bit.ly/2UOafJk	How the flood of data from connected homes can be monetized. But Frost takes a step further in the murkier landscape, raising a question on how this data can be used for healthcare, without violating privacy concerns.