FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter

Issue 13

03rd August, 2018

Table of Contents

Wearables

Google glass could help kids with autism better understand faces & emotions — Aug 03, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device)	**Therapeutic Areas**	Autism in children (ASD deficits)
Applications	Remote social / behavioral health monitoring	**Geographic Focus**	US / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Tech Innovation / Competitive Intelligence
Companies	Google	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Using Google Glass headset and a smartphone app, a small pilot study suggests that, children with autism may be better able to understand facial expressions and improve their social skills. Google recently announced initial results of its exploratory study examining the at-home feasibility of a wearable tool for social-affective learning in children with autism.

- **Industry Need:** As per the Centers for Disease Control and Prevention, about 1 in 68 children in the U.S. have autism. Although standard behavioral interventions for autism spectrum disorder (ASD) are effective therapies for social deficits, they face criticism for being time-intensive and over-dependent on specialists. The current care delivery of behavioral interventions, such as applied behavioral analysis (ABA) and naturalistic developmental behavioral interventions (NDBIs), is bottlenecked by an increasing imbalance between the availability of behavioral therapists and the number of children who must receive care. Earlier starting age of therapy is a strong predictor of later success, but waitlists for therapies can be 18 months long, which makes access and experience for current behavioral therapies complex and unpleasant for both patients and caregivers.

Google glass could help kids with autism better understand faces & emotions — Aug 03, 2018 (2/2)

- **Value Proposition:** To address these complications, Google has developed a prototype tool called the ‘Superpower Glass’ that leverages machine-learning-assisted software system and that runs on the **Google Glass headset** and an Android smartphone. The software recognizes eight emotions: happiness, sadness, anger, distrust, surprise, fear, neutral and contempt (or “meh” in child-friendly terms). Games such as 'Capture the Smile' and 'Guess the Emotion' guide children through facial and emotional recognition by displaying emoticons on the monitor, or speaking audibly. This would help children recognize faces and emotions while interacting with family and friends (social interactions).
- As part of the initial pilot project, Google’s ‘Superpower Glass’ prototype has been tested with 14 families (completing three or more 20-minute sessions per week, over one to four months). Overall, 12 of the 14 families said they noticed an increase in eye contact by their child, and six children moved to a less severe classification of autism. The assessments also showed improvements in recognizing intent, social interaction, social initiation, eye contact and accurate labeling of emotions after kids used the tool.

- Frost & Sullivan views this as part of Google’s continued focus in the healthcare space to monetize untapped niche opportunities, given the lessons learned from the failure of the first google glass commercialization effort as a general consumer device. Frost & Sullivan believes, for wearable technologies often use case dictates the market positioning and key target audience. With that we recognize Google’s renewed effort for finding the optimum marketing trade-off between its innovative Glass headset application for niche healthcare use case such as wearables for addressing social-affective learning in children with autism. Having said that, wearable devices that address a very niche use case often fail to achieve widespread adoption – moving forward it will be interesting to watch how Google ensures the scalability of the ‘Superpower Glass’ applications with customer-centric integrations and to achieve expectations for adoption and market size for future growth.

- **Target End-User:** Health Systems, Government, Healthcare Communities, Consumers

WEBLINK: https://bit.ly/2O54TFw

NTT Docomo invests in digital healthcare company Validic— Aug 03, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Device + Platform)	**Therapeutic Areas**	Health Conditions; Ambulatory ECG Monitoring
Applications	Remote patient monitoring / Ambulatory ECG	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Competitive Intelligence
Companies	NTT Docomo Ventures; Validic	**Others**	Fitbit, Garmin or other wearable device that Validic has collaborated with

ANALYST TAKE:

- **Synopsis:** NTT Docomo Ventures has invested in Validic, a digital healthcare company focused on developing services that make personal data actionable in care management and wellness programs. However, no financial details related to the investment have been released.
- **Industry Need:** 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.
- **Value Proposition:** NTT Docomo launched an application dubbed **'d healthcare'** during May 2018, to enable users to monitor their daily activities by tracking their steps and weight on a progress chart. With the integration to Validic's data connectivity platform, the d healthcare app now enables users to connect their Fitbit, Garmin or other wearable device and sync their data with the application. Based on the data generated, users can then earn d POINTs as they accomplish given healthcare goals.
- Frost & Sullivan believes, wearable technologies are approaching a tipping point that will elevate the focus from selling devices to monetize services around data driven health insights for clinical and wellness applications. Given this, cross-industry collaborations will be the key to success for wearable OEMs to explore future potential of monetizing the healthcare data economy. Entailing these trends, Frost & Sullivan views NTT Docomo Ventures and Validic's collaboration as an industry best practice to ensure sustainability and secure future revenue streams.

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

Abbott Wins Nod for 14 Day Version of Freestyle Libre— July 30, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device + Platform)	**Therapeutic Areas**	Diabetes (Continuous Glucose Monitoring)
Applications	Remote Continuous Glucose Monitoring	**Geographic Focus**	US / Global
Segment Focus	Clinical Grade	**Topics (News type)**	Competitive Intelligence
Companies	NTT Docomo Ventures; Validic	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Abbott Laboratories has received FDA approval of the Freestyle Libre 14 Day Flash Glucose Monitoring System (CGM). FDA's nod of the Abbott, IL-based company's device follows on the heels of the 2017 approval of the 10 Day Freestyle Libre CGM in the US.

- **Industry Need:** As per a WHO report, diabetes is predicted to become the 7th leading cause of death in the world by 2030. Today more than 425 million people have diabetes globally and about 50% are undiagnosed, according to the International Diabetes Federation. Despite the myriad digital innovations, till date a majority of diabetes patients have to depend on the conventional and painful method of finger pricking, which is considered an industry gold standard, to keep a tab on their blood glucose levels. There is a dire need for minimally or non-invasive glucose monitoring devices, which are considered the holy grail for diabetes monitoring. Industry participants recognize this need, and in the last 3 decades, more than 1,600 patent families were filed for non-invasive glucose monitoring by 500+ applicants. Despite this, success is limited, making non-invasive glucose monitoring device a billion dollar R&D black hole. However, with the advent of wearables into the regulated wearables space, the future for non-invasive glucose monitoring wearables looks promising.

Abbott Wins Nod for 14 Day Version of Freestyle Libre— July 30, 2018 (2/2)

- **Value Proposition:** Abbott's 14-day Freestyle Libre continuous glucose monitor (CGM) has been approved by the FDA, giving US patients with diabetes access to technology that has been used in Europe for years. The Freestyle Libre 14 day system has a 1-hour warmup and greater accuracy compared to the FreeStyle Libre system (10 day) with a mean absolute relative difference (MARD) of 9.4 compared to 9.7, respectively. To expand the sensor's time, Abbott made a slight change in the algorithm.
- Through just a one-second scan, users can see real-time glucose readings, as well as identify glucose trends with a directional arrow and review eight hours of glucose history. The sensor is worn on the back of the upper arm and is the size of two stacked quarters.
- With the ongoing success the company had a bold vision to continuously improve Freestyle Libre so that it seamlessly blends into patient's life and it makes life easier for people with diabetes.
- The 14-day system was launched in Europe in 2014 and is available in 30 countries. Abbott also reported that the FreeStyle Libre 14 day system will be available via prescription in the coming months at participating pharmacies and durable medical equipment suppliers in the US and expects sales in the $90 million to $100 million range driven by the US for 2018.
- **How it Works?** The round sensor is placed on the upper arm; a thin filament inserted just under the skin takes blood glucose readings once a minute. For monitoring, users hold a scanner over the sensor to transmit the data.

- Based on Frost & Sullivan's research, Abbott's Freestyle Libre is the leading continuous glucose monitoring device in the world, with more than 800,000 users in more than 43 countries. Given the high accuracy of Abbott's Freestyle Libre for CGM against industry gold standards (finger pricking tests) and most importantly the high adoption among diabetes patient for easy to use Freestyle Libre device have managed Abbott to bag the reimbursement money for this device both from NHS and recently Medicare coverage in January 2018.
- Frost & Sullivan recognizes Abbott's go-to market and branding strategy for Freestyle Libre CGM devices, which have proven to be a game changer in the blood glucose monitoring industry and a significant driver in sales for Abbott's diabetes unit. For example, Freestyle Libre's market winning strategy has compelled competitors such as Johnson & Johnson to discontinue its LifeScan CGM device and exit the diabetes device market.

- **Target End-User:** Diabetes Patients, Hospitals/Physicians/Health Systems, Diabetes Care Centers

WEBLINK: https://bit.ly/2LTw6xB

Mobile Phones/ mHealth

ResApp Health completes enrolment for acute respiratory disease study — August 1, 2018 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	mHealth App, AI, Audio Recognition	**Therapeutic Areas**	Respiratory Disease
Applications	Smartphone enabled diagnosis of acute respiratory disease	**Geographic Focus**	Global
Segment Focus	Clinical Grade	**Topics (News type)**	Care Delivery Innovation; Tech Innovation
Companies	ResApp Health	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Digital health company ResApp Health announced completion of enrolment in its SMARTCOUGH-C-2 study for its proprietary ResAppDx app.
- **Industry Need:**
  - SMARTCOUGH-C-2 is a multi-site, prospective, double-blind study evaluating the efficacy of the ResAppDx smartphone application in the diagnosis of childhood acute respiratory disease using cough sounds.
  - ResApp technology, if successfully validated, could potentially disrupt the respiratory disease diagnosis workflows and can replace vintage technologies such as stethoscope, x-ray and CT scans, spirometry, as well as blood and sputum tests in offering a rapid respiratory disease diagnosis.

ResApp Health completes enrolment for acute respiratory disease study — August 1, 2018 (2/2)

- **Value Proposition:**
  - The ResAppDx smartphone application intends to diagnose childhood acute respiratory diseases through analysis of cough sounds. ResApp has enrolled a total of 1,470 patients at three hospital sites in the US and has now completed the necessary recordings that will be analyzed to infer diagnoses. The data collected by ResApp will be compared to clinical diagnoses of the same patients to see if its ResApp's technology can make accurate clinical diagnoses.
  - ResApp intends to deliver its technology to patients via a B2B model whereby healthcare providers license the technology and offer it via "telehealth consultations" as well as being integrated into existing facilities used by healthcare providers.
- Frost & Sullivan believes that the technology is the latest addition to an ever increasing list of innovative, and easily adoptable smartphone enabled diagnosis tests across a variety of disease categories. The technology, if validated, could be extremely useful at addressing the chronic unmet need of timely diagnosis of respiratory diseases such as pneumonia, lower respiratory tract infection, chronic obstructive pulmonary disease (COPD), cystic fibrosis, bronchitis, asthma and even fatal diseases such as lung cancer. It's successful integration into existing respiratory disease screening could save healthcare costs currently spent on complex tests and invasive sampling as well as improve care workflows.

- **Target End-User:** Patients, clinicians, path labs, hospital networks

WEBLINK: https://bit.ly/2LSlq2d

No benefits to brain training games: Western study finds no improvement in cognitive skills — July 30, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth Apps	**Therapeutic Areas**	Alzheimer's Disease, Dementia
Applications	Healthcare gamification	**Geographic Focus**	Global
Segment Focus	Consumer Grade	**Topics (News type)**	Tech Innovation
Companies	Western University	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Researchers at Western University have found no evidence that brain games offer any significant cognitive benefits
- **Industry Need:** Several brain training applications are widely promoted as positive influencers for the brain, including whether they can improve working memory or offer any cognitive benefit are present in the market. While single such studies do not have a significant impact on their adoption, they serve as a timely reminder for existing players to improve the efficacy of their applications for better results.
- **Value Proposition:** The paper, published in the journal Neuropsychologia, suggests that all that training has basically zero impact. The study, involving 72 participants found no notable improvement in brain function of participants after 13 hours of brain training games against the control group. On the contrary, the study found that things like sleeping well, a healthy diet, socializing with friends are really good, proven ways to help improve cognition and health in general. These tips can not only improve cognitive health, they can also delay cognitive decline such as dementia.

WEBLINK: https://bit.ly/2O9TOmF

Smart Home Devices & Appliances

NutriBullet Balance: A Connected Blender That Gives You Real-Time Nutrition Data On Your Smartphone – July 31, 2018 (1/2)

Applicable Product Categories: Smart Home Devices

Technologies	Sensors	**Therapeutic Areas**	Health & Wellness
Applications	IoT	**Geographic Focus**	UK
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	NutriBullet	**Others**	-

ANALYST TAKE:

- **Synopsis:** NutriBullet is launching the NutriBullet Balance, which uses the SMART Nutrition System to connect to a smartphone / tablet app to provide nutrition data – calories, proteins, carbs, fats, sugar content, leveraging its built-in nutrition sensor.

- **Industry Need:** From diabetics and other chronic disease sufferers to those suffering from food allergies, and then to those who are in to fitness and athletics, the need for tools to measure content and nutritional value of food intake is critical for several population groups. Diabetics for instance need to know their sugar intake to comply with diet regiment and also to calculate insulin doses (when applicable). There are 425+ million diabetics; an estimated 190 million people suffer from food allergy globally – the demand for such tools can be really high. The current lack of such tools, or widespread accessibility or affordability around these have not resulted in higher adoption. The lack of awareness around the importance of having controlled diets is also at play; however, rising obesity rates and chronic disease prevalence are gradually changing this scenario.

NutriBullet Balance: A Connected Blender That Gives You Real-Time Nutrition Data On Your Smartphone – July 31, 2018 (2/2)

- **Value Proposition:** The Balance weighs food items as these are added in to the blender (with inputs on the companion app), allowing it to count nutritional content. The app also features a virtual nutritionist to suggest recipes based on available food items, and can be customized to suit individual dietary preferences, restrictions and nutrition goals.

- Frost & Sullivan believes this appliance to be a good addition to the smart home ecosystem – along with smart refrigerators and ovens. Current food oriented smart home appliances don't necessarily cater to the nutritional value of food (beyond tracking freshness and expiration), hence this is a good addition. Food 'sensors' (DietSensor and Nima) are portable devices but can also be integrated in to this ecosystem, to cater to the dietary and wellness requirements of smart home residents.

- **Target End-User:** All residents with dietary monitoring needs – chronic disease patients, weight loss aspirants, allergy sufferers and wellness enthusiasts.

WEBLINK: https://bit.ly/2n6MWuE

Does integration and amalgamation herald the death of the smart home hub?– July 31, 2018

Applicable Product Categories: Smart Home Devices

Technologies	Devices	**Therapeutic Areas**	NA
Applications	AI, IoT	**Geographic Focus**	Global
Segment Focus	Consumer Grade	**Topics (News type)**	Other Trends
Companies	NA	**Others**	-

ANALYST TAKE:

- **Synopsis:** As AI and voice interactivity enabled smart speakers build out ecosystems to control other smart home devices, the smart home hub is becoming obsolete.
- The article touches upon an unsaid trend with technology, especially in the smart home – that of obsolescence. While the crux of this opinion is fairly logical, it subtly hints at the extremely fast pace of technology development, making product obsolete much faster. The inherent, under valued challenge of this pace, is the barrier it poses to higher adoption of advanced technology. As consumers make hefty investments in smart home products, they are unlikely to quickly replace the gadgetry for the “latest iPhone”, barring a select few early adopters and tech enthusiasts. Developers of these gadgets and appliances for the smart home need to devise strategies to help consumers adopt new tech (at a simplistic level – exchange old car for a newer one at a discounted price, for example). This is especially true for the earlier generations who are still used to buying products for a lifetime (more than a decade).

WEBLINK: https://bit.ly/2OkJpp5

Success in smart cities depends upon success in the smart home – July 31, 2018

Applicable Product Categories: Smart Homes

Technologies	Sensors, Devices	**Therapeutic Areas**	NA
Applications	AI, IoT	**Geographic Focus**	Global
Segment Focus	Consumer Grade	**Topics (News type)**	Other Trends
Companies	NA	**Others**	-

ANALYST TAKE:

Frost & Sullivan: The article alludes to two major points as opinion:

- Today's so called smart homes are not really smart. Frost views them as merely connected homes (with one or more systems connected; explained in detail in the Vision 2025: Healthcare in Smart Home study). The true use of AI to bring in higher and higher levels of automation in the home will make them truly smart. The fundamental need for this is to have several connected devices and systems in the home, and for AI to leverage these in various scenarios to make the residents' lives easier. [e.g. tracking weather, resident preferences and occupancy to automatically change thermostat settings in areas of the home.]
- This level of 'smartness' in the home, will enable 'smart city' initiatives – similar to an article discussed in the previous newsletter around public health. This level of smartness will need several tech advancements – big data analytics, AI on the edge (with smarter chips), and of course, cybersecurity.

WEBLINK: https://bbc.in/2LpxuZb

Aging-In-Place News

Several 'Smart Homes for Aging-in-Place' initiatives are coming up across Europe and the US, and have been covered in previous newsletters. Since the theme remains the same, additional articles have been added here:

News Title	Region	Date	Link
Smart homes track health and fitness of frail owners	US	July 27, 2018	https://bit.ly/2M4NO1e
NHS-backed smart sensors for the elderly could help them stay in their homes for longer	UK	July 27, 2018	https://bit.ly/2vy51pv