

## Life Watch: A Study

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### ABSTRACT

In today's world its all about health and fitness along with way to prolong health and age, that is why the author tried hard to come up with something that aids that current trend of life objectives. The author's idea is to create a watch that constantly measures the user's physical movements and sleep cycles and calculate how much energy the user as a person has consumed and how much energy they have left during the day, the same way the user knows when to charge their electronic devices, now they will know when to re-charge their body energy by knowing how much sleep they need and how much physical activity they have left in their body energy tank. This simple idea is to give the user a percentage of energy utilized during the day, which will in turn give the user the percentage of energy left for them to utilize during the remainder of the day. To conclude, this watch will be a first step in connecting technology and health in an innovative way and will be a footstep to an industry ever growing and expanding on a daily basis.

**Key words:** life watch.

### Introduction

The Fountain of youth has always been something that humans have been looking for and seek to find to enable them to be immortal. Hence, Day by day human beings are innovating medicines, diets and special formulas to prolong age.

Technology and medicine are interloping as the years pass by and soon enough researchers and scientists will be working on having robots to perform surgeries on humans to minimize errors and limit fatalities. This increase in health awareness has intrigued the author to try and input something that would in turn help in making life healthier. As the author doesn't come from a medicine background, the author thought that it would be more suitable in coming up with an idea that is proactive rather than reactive, as in something that will help prevent disease rather than cure it, therefore, the author kept jotting down ideas on a daily basis trying to be creative and saw that the one common thing that humans have from different ages and social sectors is the mobile phone. This made the author try and squeeze an idea that will be linked to the phone,

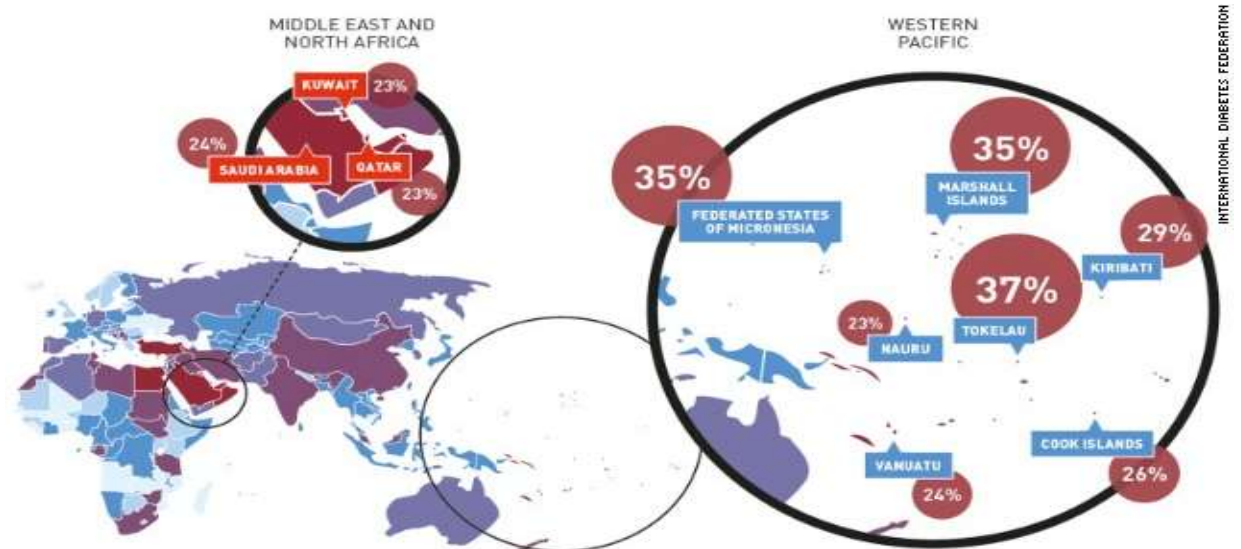
which is in turn is linked to humans as statistically around 2 billion people have mobiles.

The author needed to come up with something that was attractive to use and not dull as in today's world fashion steers a lot of things, there has been an over lot increase in the use of fashionable fitness trackers/watches like the Iwatch , Fit-Bit, Jawbone, Gear Fit , Garmin, Under Armor band and more.

This made the author think of creating something that will add to the already existing measures that the fitness trackers/watches have. The author always wanted to know how much energy do we have left for the day and always calculate how many hours of sleep will we get if we sleep at a certain time. When asked around family and friends most did the same thing where in before sleeping they would calculate how many hours of sleep would they get when waking up at a certain time. That made the author think of creating something that would tell the user how much energy have been used during the day and how much energy will have left. Think of it like a

mobile phone or any other electronic device where there is a measure that shows the user how much percentage left of the battery. If we try and emulate the same mechanism to the human body then we can use the hours slept as basis for this calculation. As in, everyone has 24 hours in a day let's say out of this 24 hours a person would sleep 8 hours so  $8/24 * 100$ : Approx 34%. So a person would have 66% left from his energy. Other indicators that might affect the energy consumption and remainder are hours spent working out, doing yoga or working at the office. In my opinion hours spent working out can energize and vitalize a human body and thus can be put as a factor that increases the energy levels remaining in a human body tank. On the other hand, hours spent in the office should reduce the amount of energy left in the human body tank as they count as hours where in mental and physical energy are being used. Yoga can be counted as an activity that helps in increasing the energy left in the human body tank as yoga increases flexibility, muscle strength, respiration, energy, vitality and help in reducing weight levels. Moreover, Yoga helps in improving cardio and circulatory health. Not all people recognize this but heart disease constitutes of 30% of global deaths and if yoga helps in having a healthier heart then it would definitely help in increasing the energy level in the human body tank.

### Life watch and Diabetes



(The image above shows the percentage of Diabetic patients in 2013 according to the International Diabetes Federation)

One of the diseases that the author personally distastes and is quite common in the family genes is diabetes and globally 8.5% of the world's population suffer from diabetes which made the author really want to help and try to reduce the negative impacts of having diabetes. It is a well-known practice that blood has to be drawn to measure the sugar levels in the body and treat it if it is above the normal level. This is a reactive way of reducing the impact of a disease and the author stated in the beginning of this paper, trying to introduce a pro-active way to help in reducing disease. That is why the author came with the idea of the fitness tracker/watch having the feature of measuring the sugar level without the need to draw the blood. One of the most feasible ways to measure the blood sugar level would be through the blood temperature or more specifically through human sweat. One of the features or let's say lines for the fitness watch/tracker would be one that has a GP-based patch that allows accurate diabetes monitoring and provides feedback though utilizing human sweat. Through the electrochemical integration and soft function materials on the hybrid of gold-doped grapheme and a serpentine gold mesh we can improve the device's detecting abilities. Systematic corrections of sweat glucose measurements can be enabled through the device's pH and temperature monitoring functions as the enzyme-based glucose sensor is affected by pH (blood acidity levels) and temperature.(1)

The production of Insulin occurs in the pancreas and it regulates the glucose use, which in turn maintains the blood sugar balance. The main harm of Diabetes is that it causes an imbalance as in the insufficient amount of insulin results high blood glucose levels, known as hyperglycemia.

The most common form of diabetes is Type 2 diabetes with no known cure to date. The current treatments available are inconvenient, painful and costly as described by some of the family and friends that suffer from diabetes; they visit the doctor regularly and kits are used at home to record the glucose levels. My family and friends also complained of having to inject uncomfortable insulin shots to stabilize glucose levels. There is a substantial need for non-invasive, pain free and stress-free monitoring of important markers of diabetes using multifunctional wearable devices. The fitness watch/tracker should facilitate this and hence reduce the lengthy and costly cycles of visiting medical professionals and hospitals.(3)

The wearable fitness watch/tracker is GP-based and is capable of not only sweat-based glucose and pH monitoring but also controlled transcutaneous drug delivery through temperature-responsive micro needles.(2) So basically there will 2 lines of the fitness tracker/watch at the start up where in one would be just giving you the percentage of energy utilized/left by/in the human body tank and the 2<sup>nd</sup> one will be more of a customized fitness watch/tracker for diabetic patients. When it comes to the customized fitness tracker/watch the measurements that are precise will be made for the sweat glucose concentrations, which will be used to measure the level of glucose in the blood of patients. The device should maintain its original sensitivity after multiple uses, to allow for multiple treatments. Point of care treatment of diabetes will be enabled by the connection of the device to a portable / wireless power supply and data transmission unit. The patch will be part of the fitness watch / tracker and be applied to the skin where the sweat-based glucose monitoring begins on sweat generation (wrist)(5). There will be a humidity sensor that will monitor the increase in relative humidity (RH). The average

time needed for the sweat-uptake layer of the patch to collect sweat is 15mins and also reach a RH over 80% at which glucose and pH measurements start. (2)

The fitness tracker/watch projects intense advances over the traditional treatment methods by allowing non-invasive treatments. One of the things the author likes about this is that it will help patients that have a phobia from looking at blood as the fitness tracker/watch will help prevent that. One other level that the author is thinking of for the future is having the drug being released directly from the device via drug loaded micro needles that can be placed on the sides of the device. This drug can be released when abnormally high levels of glucose are detected.

Now as a fitness tracker/watch there should be a way for the device to convey the data being collected in simple way to users/patients. The best way would be through percentages and graphs so along with the device there would be an app that will be free to download for one mobile device but will have a cost to download on a second device and the initial price should be \$0.99 per year which is a very cheap and convenient price comparing to the price being paid for medical tests and appointments with private hospitals and pharmacies. The percentages in the normal fitness tracker /watch should show the amount of hours slept and percentages of the energy utilized and the percentage of energy remaining and it should automatically calculate and update the percentage with the consumption of meals or the completion of workout sessions or yoga sessions. Later on a feature might be added where in the fitness watch / tracker based on the character of the user will recommend nearby events and new places that help in the energy levels. The character of the user will be profiled by using a registration step to be completed at the time of the installation of the app. The same way "Siri" of apple iPhones provided suggestions; this app will do the same and also will be equipped with reminders of medicines, meals and sleep timings. Mental energy will be a more complicated step which won't be much focused on in the initial stage but in the

future there can be suggestions and reminders to watch the favorite TV shows or books based again on the character portfolio gathered at the time of the installation of the app.



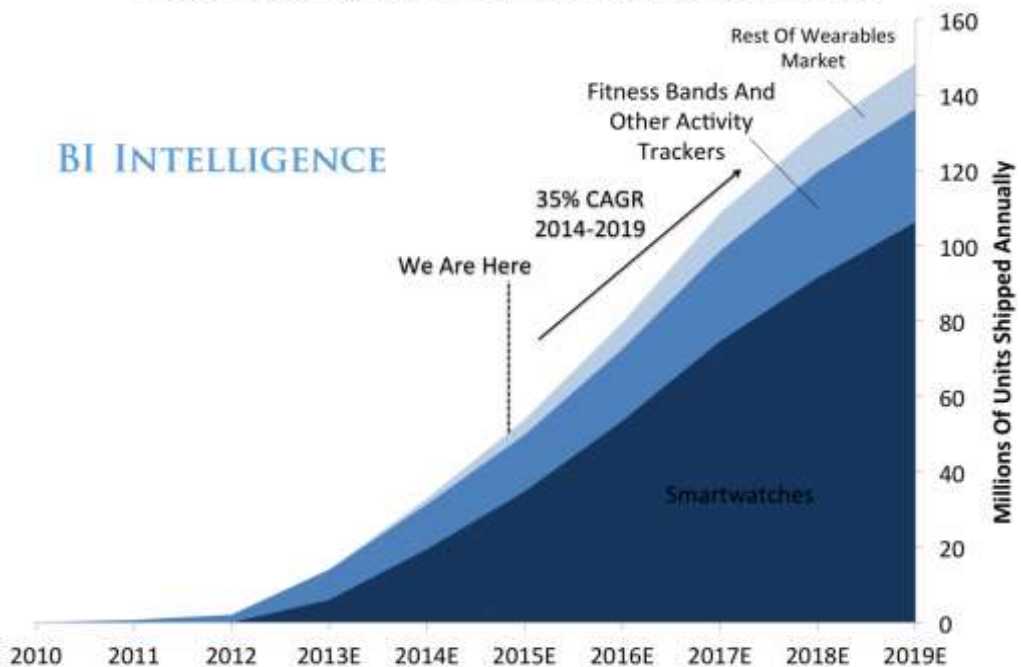
**The fitness edition**

Now to elaborate more on the regular fitness watch/tracker the idea is for it to be rubber strapped with a steel base that would make it simple and fashionable at the same time. A design team would be used to make it look nice and the proposed brand name is "Life Watch" which has a pretty clear message of improving life in general when it comes to health. One feature for both the regular and the customized Life Watch, which will be developed for the future editions, will be an

automatic sync with the Mobile's Cellular network. The main purpose for this will be to input the meal that will be consumed and this will be automatically searched via Google or any search engine site. Then date on the nutrition values will be automatically inputted in the device this can help in a lot of things. For example there is something called as BMR (basic metabolic rate) which gives you the amount of calories needed to maintain/increase/decrease weight and this can be calculated in the Life Watch and give a heads up to the user with regards to the meal due to be consumed (4). The vision of Life Watch is for it to be a life companion providing 24/7 services of a medical professional, personal trainer and personal alarm.

With time the design can be altered and cope with different trends in today's world as in the colors and types. So in future there should be a life watch for kids, women and men. And the success of the initial set up will lead to the idea of customization as humans naturally tend to be more attracted to customized items and the life watch can be initialed or have engravings the same way "Nike" introduced the personal engraving on shoes on celebrities like "Kevin Hart" and athletes like "Lebron James".

**Global Wearable Device Unit Shipments Forecast**



(The image above illustrates the current and future shipment levels of wearable device units)

Other than that in future the use of Ambassadors is part of the vision of Life Watch, as people tend to follow the trends of celebrities and athletes. Plus, globally products such as Life Watch can help impact the population health wise and be of a positive impact not just commercially but ethically as well. The commercial part of Life Watch is still under study but the initial price of a device would not exceed \$100/- as the aim and vision is for it be available easily. There is a plan where after initial success that Life Watch collaborates with the WHO (World Health Organization) and for it to be used by the UN (United Nations) to be available in Undeveloped and Developing countries (Third world countries).

### The vision of the LifeWatch

Initially, The application will be a very basic and simple version due to lack of funds as a startup, so it will just have the normal graphs and statistics that show the sleep cycles and the amount of energy utilized/consumed. With time more features like the BMR calculator will be added along with the customized preferences of the user. The beginning launch will be locally and around the region and with time it will expand globally. Think of Life Watch as a wearable personal assistant and will have the feature of having the personal flights and business meetings inputted and help in giving constant reminders for a lot of stuff.

The human brain can take a limited amount of information during a day and with today's world and the increase of daily activities that amount of information is even less. So think of Life Watch as an aid that will help the mind of the user without being in control. As in Life Watch will aid and not replace the personal thinking of the user and that is why it will user-friendly and can easily be shut down or kept on sleep mode.

The customized health Life Watch will be a bit more complicated than the normal one and won't be launched in the market initially as it needs further Research and Development that is too costly for a startup. The plan is to attract investors with this paper and try to inject finance to help in having a safety net just in case things go sour

commercially. However, the ownership from external investors won't exceed 49% as the author wants the device to remain as original as possible and wants the vision to remain the same and focus more on the benefit of mankind than commercial aspirations as they have the vision of Making A Difference. Making A Difference will be the motto of the device and will be driven by it, the same way Nike's motto is "Just Do It".

### Conclusion

To conclude, this is all based on a simple idea of trying and eliminating the effects of disease before happening as a pro-active measure and to raise awareness of health with the aid of technology. The input of doctors and medical professionals will be of great help to try and make the device as healthy as possible as wouldn't want to innovate a device that would have detrimental effects on the health of the user as in wouldn't want to risk shutting down the vision of my product of harming its reputation.

In the end, this is a concept that will depend on a lot of intangible factors that are uncontrollable such as competition, Economic stability, and inflation and consumer preferences.

Will try and produce a device that will have a positive impact on the world population when it comes health and overall fitness. The grander vision will be to help in reducing the effect of the incurable type 2 diabetes and also improve the medication and treatment of the disease in a way that will open doors in the medical world.

The author hopes that this device is simple to grasp and that I was able to project my inner vision in a way that is easy to comprehend and understand.

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**Good management is the art of making problems so interesting and their solutions so constructive that everyone wants to get to work and deal with them.**

**~ Paul Hawken**