

# The BodyBuddy: Personalized Maintenance of a Healthy Lifestyle



**POOYA BANAPOUR**  
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# Abstract



According to the American Heart Association, nearly one in three Americans will develop a chronic illness such as diabetes, obesity, or atherosclerosis which can end lives prematurely and amplify the burden on the healthcare system.<sup>1</sup> The manufacture and use of the minimally-invasive BodyBuddy personalized healthcare system seeks to reduce this problem by individually monitoring one's vital functions, blood contents, nutrition intake, body composition, and genetic profile to generate a nutritional and exercise profile. By adhering to the specific nutrient intake guidelines, the individual may maintain a healthy lifestyle and reach his/her long-term health goals safely and efficiently.

# Concept/Topic



Maintenance of healthy eating and exercise habits is the safest way to reach one's long-term health goals.<sup>2</sup> The concept incorporates preventive care, or measures performed to prevent illness or injury, to prevent long-term illnesses through a biotechnological device. The device utilizes bioelectrical impedance, an automated analyzer, and fingerprick testing to inform the individual about what foods he/she should intake and what exercises he/she should perform. By educating the individual about his/her body's needs, the individual is encouraged to treat food and exercise as medicine and nourishment to prevent future complications.

# Context and Precedents



Preventable causes of death are responsible for nearly 900,000 deaths annually.<sup>3</sup> Such deaths include heart attacks, strokes, other types of ischemia, and nutritional deficiencies. Moreover, the cost of treating such procedures has skyrocketed within the last few decades. The estimated cost for stroke alone amounted to over \$62.7 billion in 2007.<sup>4</sup> The adoption of healthy lifestyles not only reduces annual healthcare costs in such an unstable economy but reduces the number of deaths per year. Several devices have been prepared that attempt to maintain healthy lifestyles for individuals, but none are as efficient, personalized, detailed, informative, and all-encompassing as the BodyBuddy. Nutrition analyzer software has been popular but simply keeps track of macronutrients and calories and does not cater to an individual's nutritional demands. Moreover, automated analyzers used in examining blood samples have been developed but are restricted to laboratories and hospitals. Lastly, the techniques of bioelectrical impedance, DEXA scans, the BOD POD, and deuterium analysis have been developed to determine body compositions but each have their respective shortcomings.<sup>5</sup>

# Context and Precedents (cont'd)



**DEXA Scan**



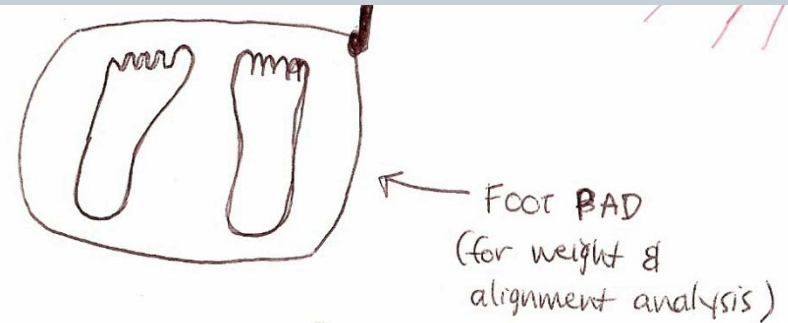
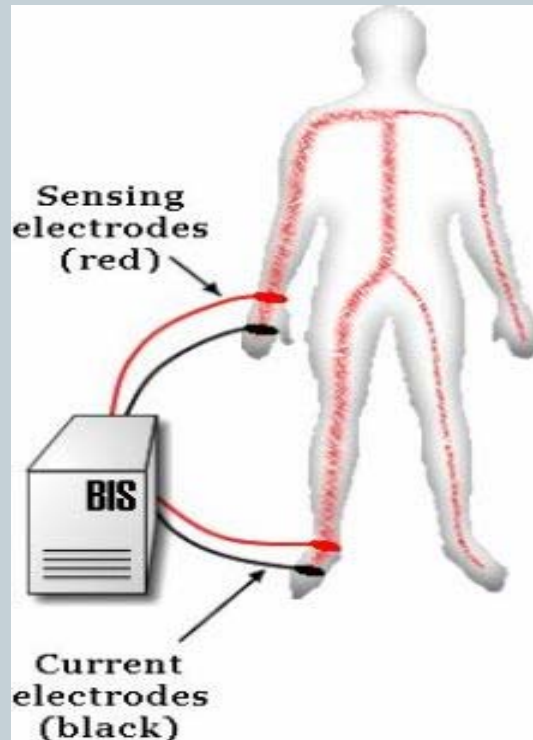
**BOD POD**

# Project Proposal



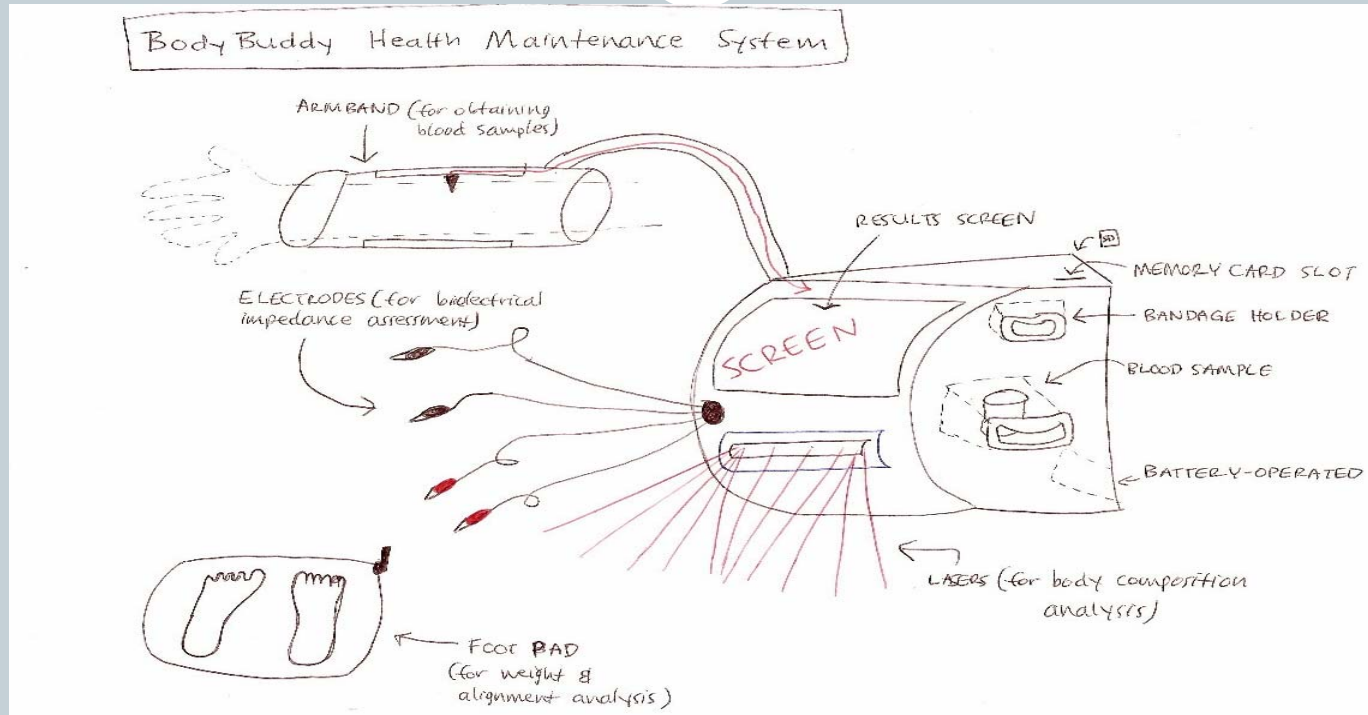
The individual uses the BodyBuddy once every three months for a total of four times per year. First, the individual straps the attached wristband onto the forearm or bicep and holds still until blood pressure readings are obtained. Next, the computer inside the wristband employs a device which pricks the individual. A small blood sample is obtained from which amounts of sugars, buffers, wastes, proteins, drugs, fats, enzymes, antioxidants, minerals, hormones, blood cells, and gases are obtained.

# Project Proposal (cont'd)



Next, the attached electrodes are used to perform a bioelectric impedance test from which body fat percentage, hydration levels, and lean body mass is recorded. Also, the individual steps on a scale with sensors to determine weight and alignment.

# Project Proposal (cont'd)



Lastly, a set of lasers performs a scan on the individual to determine the body shape and finalize the body composition. From this information, a specific nutritional profile that outlines the foods the individual is in need of is created. In addition, the analysis determines the amount and types of cardiovascular and resistance exercises needed to strengthen specific muscle groups.



# Conclusion



The dramatic rise in chronic illnesses has led to many regrettable and preventable deaths and additional burdens on the healthcare system. Assuming that an individual is healthy, the BodyBuddy studies one's health status and body composition, seeking to set personalized daily nutrition and exercise guidelines for an individual to be an active participant in his/her health. The BodyBuddy serves as a coach, counselor, physician, nutritionist, and trainer in achieving one's long-term health goals. Further development must be conducted to integrate the system directly to one's physician to for additional review and consent.

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- 4 “Interesting Facts and Statistics about Stroke.” Disease and Condition. 2009-4-25. <<http://stroke.about.com>>.
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