Practicum Proposal

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# Project proposal

## Area of Focus

The unit of focus and primary focus area is General Health Informatics, focusing on nutritional tracking. This will also tie into analytics and visualization, as the intent is to display nutritional information to an individual through an app.

## Background and Significance

One of the largest problems of the American healthcare system is the high cost. As a country, “the U.S. spent $8,713 per person or 16.4 percent of its GDP on health care” (Barrows, 2016). This is nearly double of an average industrialized nation would spend. There are several reasons for this, such as rising administrative cost, and a rise in chronic diseases. Administrative costs come directly from the multitude of insurance companies. Each company negotiates for itself, and there is no set max or min for procedures. Because of this, it is possible for a hospital to charge two different prices for patients based purely on variations in patient insurance. With insurance companies developing more plans, for various levels of coverage, the number of possibilities in codes and billing increase - requiring even more administration to manage.

Chronic diseases are another rising factor in higher healthcare costs, as patients spend more time and money in hospitals and seeing physicians. While difficult to treat once developed, their development can be slowed through preventative care. However, there are difficulties in focusing on this. A significant one would be the lack of physicians per capita. Studies have shown that “the U.S. had 2.6 practicing physicians per 1,000 people—below the OECD average of 3.3” (Barrows, 2016). This number into account all physicians, including specialists that people would usually have few reasons to see. Focusing on primary care physicians (PCPs), the number drops even lower – and this is just the average. The geographic size of the U.S. results in an uneven spread of physicians between states, resulting in difficulties in maintaining a standard of care. While it is unlikely that the U.S. can easily shift to focusing on preventive care, there steps individuals are able to take on their own. One of the most notable, is nutrition.

## Problem

Nutrition serves as a basic cornerstone of healthy living, helping people to maintain a good lifestyle. Research has shown that “that diet quality has a huge effect on physical condition, cognitive condition, bone health, eye health, vascular function, and the immune system” (Institute of Medicine, 2010). Continuing an over consumption of unhealthy foods impairs cardiovascular health, and can cause insulin resistance to develop, a precursor to type II diabetes. Malnutrition through under-eating, while not causing well-known chronic diseases, causes significant mental health issues and has the possibility of developing into a feedback loop. As malnutrition sets in, people may lose interest in eating and drinking and become depressed, making it even more difficult to obtain the right nutrients.

## Proposed Solution

The proposed solution for is to create an application that would allow an individual to track nutritional requirements based on their food consumption. A user would be able to either enter through text or take a picture, and the app would be able to parse out the nutritional facts from that and update a visualization. This would be done by accessing a database maintained by the app to determine the nutritional facts of an item. Because there are so many nutritional requirements, displaying all of them would be incredibly complex and render it pointless. Overtime, the app would display commonly obtained goals less often on the dashboard, simply displaying a list update and banner notification when obtained frequently.

## Technical Complexity/Effort

The complexity here would be creating a learning dashboard view that could be adapted to specific users. This would require machine learning knowledge that I currently do not have. However, basic counters and checks can be implemented in place of an actual learning system to obtain a potential prototype.

Another technical issue would be implementing the image recognition – there are several open-source projects that could possibly be utilized, but the difficulty would be integrating it into the application and throwing out any incorrect results.

Although there is potential for HIPAA to influence this application development, it is currently outside the realms of medical information. The data this application would collect is currently not considered medical information. If the app began to ask medical history questions to obtain a better background of the user, then it may fall under HIPAA. Current laws relating to the area of health-tracking applications are under-developed, allowing for a certain amount of freedom with security. However, it would still be practical to protect privacy and data, as users would expect a certain amount of security even when sharing non-medical information.

## Team Members / Roles

This would be an individual project.

# References

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