

Senior Design Project: Constraints Essay

The aim of our project is to develop an app to help people better understand their everyday diet in terms of nutrient intake. Because diet is one of the most essential aspects of a person's health, we want to make it possible for people to create informed dietary decisions for improving their wellbeing. The end-user experience will include customized suggestions and intuitive depictions of progress towards goals. We aim to keep the end-user experience simple and hide most of the complexity behind an intelligent data processing infrastructure. There are a number of **ethical**, **social**, and **environmental** constraints that go into the solution we end up developing.

Because nutrition is so integral to a person's overall health, the design of our solution needs to take an ethical approach above all other considerations as we are designing various components. It would be irresponsible to develop this system without ethical integrity. Imagine a system which is advertised as promoting health but it makes superficial and sometimes dangerous suggestions. There are plenty of examples of this on the internet. While specific diets are difficult to compare empirically, there are plenty of examples of scientifically baseless and potentially dangerous diets when they are taken too far, like a "fruit-only" diet which lacks the essential macronutrients of fat and protein. We should be very careful that our suggestions lead to a sufficiently balanced diet while still allowing for the user's own agency in determining foods and dietary goals that are sustainable. Another important ethical consideration is how we position our own ethos in making the suggestions. Software should provide insight and analysis, but not medical advice which is reserved for professionals.

Additionally, we are making sure that we are compliant with state and federal regulations on nutritional information. Primarily, we are aiming to try and make our software legally sound. This includes making sure that we only leverage publicly available intellectual property and also verify their usability policies. The primary intent of this is to make sure we do not face any disputes at any point of development or post-launch.

Another constraint that is essential to consider for the project is security. We will need to take basic information such as an email and a password to make an account as well as needing some basic medical information such as body measurements and dietary restriction. We want users to feel comfortable putting this information into our project without having to think about if their information could be compromised. We will need to keep security checks in mind for every step in our implementation to best prevent any way for data to be accessed by an unauthorized party. Having systems to ensure the person accessing the account is the real account owner is necessary so we may implement an option for two-factor authorization for those who want to be extra careful that their information is secure. We also have to make sure that our backend is secure as well so that our database is not able to be modified when it is not supposed to be.

The pinnacle of general correctness is "close to perfect" every time rather than risking overdoing. Same is seen herein construction of the "perfect food profile" - there are lots of nutrients that are safe past recommended value, while a couple aren't. For instance- overstepping effects of consuming iron past RV (even by minute ranges, Delta: 30% CI: 11%) has been linked to Alzheimers. We are super careful about that and hence we come up with special metrics (other than FDA's RV) given our constraints.