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1. Market Opportunity:

The world is changing as people are shifting towards a health consciousness and there's opportunity in the market to provide services to the new influx of clients. The problem is that plates of food don't come with nutritional composition attached. This can block individuals from being able to track their intake and match it to their personal nutrient needs. A lack of accessible tools to accurately measure nutritional content and a growing interest in health and fitness tracking (Das et. al, 2022) contribute to ensuring the relevance of our app.

Diet is the largest influencing factor on someone's health, so not tracking performance in this area is a hugely missed opportunity. People who really want to make a change for the better find this infuriating as it feels out of their control, which can kill their confidence to continue a health supporting path. This is why we are developing NutriTrack, an app that provides and logs these essential nutritional features to meals by simply snapping a picture of the plate.

The great thing about working on fitness is that anyone can take control of their decisions to live a healthier lifestyle. Our target audience includes fitness enthusiasts, health-conscious individuals, and dieticians (Das et. al, 2022). Fitness enthusiasts aged 18-55 are looking to gain personalized data on their eating habits. Beyond this wide audience, the functionality of our app expands to people who need help monitoring their health conditions based on their consumption. Our success is highly important for this audience, for whom it's a matter of getting all the help they can to best manage their conditions.

The projected market size and niche where our app would sit is shown below in medium blue:
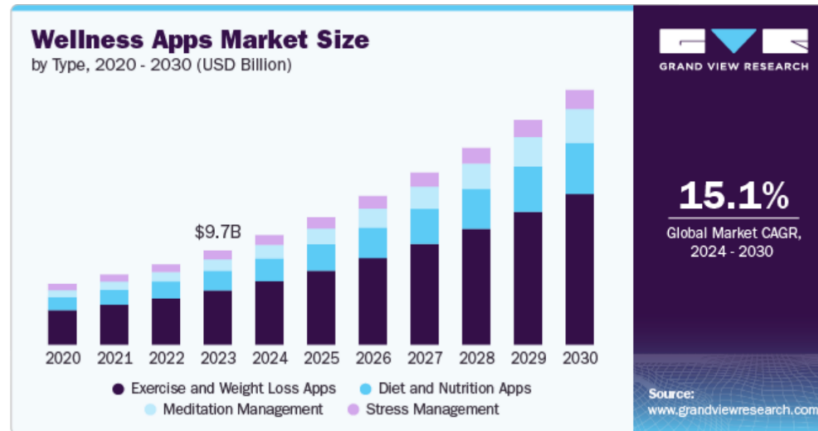
This visual above comes from the Grand View Research group, who created an extensive report looking into the wellness app market (2024). According to this report, "The global wellness apps market size was estimated at USD 9.67 billion in 2023 and is projected to grow at a CAGR of 15.1% from 2024 to 2030," a very promising outlook for the future of Nutritrack.

In addition to the wellness app market, fitness app market growth bodes well for Nutritrack. Fitness app market growth is predicted at a CAGR of 21.6% from 2021 to 2028 (Spraul, 2024), and at a CAGR of 29.95%, reaching USD 56.29 billion by 2030 (Research and Markets, 2024).

Creating an app allows for access to the entire market as it will be accessible to everyone, and we can see the tremendous potential industry as it grows by over 15% per annum. Growing awareness globally is pushing people into the market and the pressure to join in on the health craze will only grow with time; as well-being is of great priority to everyone, it's an easy sell.

The greatest value-add is convenience without question. Theoretically, people can manually search the nutritional facts of every item on their plate and write it down, then add up all the information. This is evidently very tedious; people already take pictures of their food for fun, which makes the process of adding a health bonus incentive as easy as can be. This could all be meaningless if the app outputs a bunch of gibberish, which is why we are resorting to some of the strongest machine learning models, neural networks, to ensure the accuracy of our app.

2. Competitive Landscape:

Competitors such as Calorie Mama, Bite AI, Foodvisor, and Diet Camera AI, each offer their own approach to food logging and nutritional tracking. Here's a closer look at these key players:

- **Calorie Mama**: Calorie Mama uses AI to analyze food photos for calorie counts and macronutrients. While it offers integration with fitness apps, it lacks robust wearables integration and personalized diet recommendations, which Nutritrack can capitalize on.
- **Bite AI**: Known for its speed and ease of use, Bite AI focuses on AI-powered food identification but doesn't provide detailed insights into long-term diet trends or personalized meal planning.
- **Foodvisor**: A strong competitor offering calorie tracking and meal suggestions, Foodvisor's premium plans focus on coaching but don't integrate well with wearable devices or offer a gamified experience to retain users.
- **Diet Camera AI**: Primarily marketed for quick calorie counting, it lacks a community feature or streak-based gamification, which Nutritrack plans to emphasize.

Key Differentiators of Nutritrack:

- **Wearables Integration**: Unlike competitors, Nutritrack will offer seamless integration with devices like Fitbit and Apple Watch, enabling users to combine dietary data with activity and sleep tracking for a holistic view of health.
- **Gamified Experience**: Nutritrack will motivate users with badges, streaks, and community engagement features, fostering long-term retention and creating a sense of achievement.
- **Diverse Food Recognition Database**: We aim to address a significant gap in ethnic and cultural food diversity by leveraging global datasets like Open Food Facts and crowdsourcing images to enhance inclusivity.
- **Enhanced Analytics**: Nutritrack will offer predictive analytics and personalized meal suggestions based on long-term usage patterns, a feature that remains underdeveloped in competing apps.

Nutritrack bridges the gap between convenience and precision, offering a superior user experience by integrating advanced machine learning models with wearable technology. By focusing on user-centric innovation and addressing limitations in the existing apps, Nutritrack is positioned to dominate the wellness app market segment.

3. Monetization Strategy:

Apps have many ways of generating revenue, and we investigate four different streams: subscription types, ads, partnerships, and data licensing.

The Freemium Model looks at providing users with free or premium versions of the app. The premium version would come to $9.99/month and would build upon the basics of photo analysis and meal scores given by the free version. Features would be built in the premium version that would suggest meals after learning the user's eating pattern by tracking their usage for a week, along with additional analytics. The free tier would still bring in revenue to cover our assets by including many ads that the premium version would limit. These ads can come from companies that share our target market, from the meal kit, supplements, or fitness equipment industries.

To help other companies get more use out of their products, we would look to explore partnerships. For example, a deal can be struck with Apple or Fitbit to sync their calorie-burning technology to our meal intake, thus building a more appealing product. Lastly, the great part of working in analytics is that there is plenty of metadata coming through our system on our clients. This data is extremely valuable to players in certain industries, such as research or health organizations, that are looking to learn more about how individuals have been making shifts in their dieting through our app. An agreement could be negotiated with consenting clients to have their data sent to these organizations, which would provide us monetary supplies in exchange.

4. User Engagement:

Assuming no large initial investment to get the app off the ground, building the user base is always a challenge. A cost-effective way of building a presence is through media, by having content created for all the interactive networks. This can get us off the ground quickly and give users a snapshot of how we operate. Eventually, to launch more aggressive marketing

campaigns, some investments will need to be made. We would start with influencers with lower prices and work our way up to bigger social platforms if there's evidence that the investing is worthwhile. In addition to fitness influencers, we could partner with a multitude of different organizations such as gyms and nutritionists to recommend the app to their clients.

To initially hook users on our product, we would offer a conditional premium version for the first 14 days of their signing up to give them a look into all the capabilities, in the hopes that users sign on for the subscription. Growing the marketing campaigns is critical in the infant stages of the product, as evidence of a revenue-generating app can help bring on more investment that can allow us to continue to innovate the app to keep our users.

Retaining users is half the battle of growing our network and limiting churn levels whenever possible. The best apps leverage their platform to create a community of all the users and include opportunities for some interactions between them. We will include a form of network to be able to share and upload their pictures or insights so that a community can be built in collaboration with our users. Finding out which friends are already in the app and connecting with them by sharing a contact list was one the biggest improvements to LinkedIn's user base, and we can see it helping our platform as well.

The app will feel more like a fun game by including streaks and badges to reward people for continuing down this healthier path they are seeking. Motivation to keep going using the app will grow as users collect valuable badges. The greatest key to retaining users is innovation. The product needs regular updates based on user feedback and trends in the market to continue to provide the highest level of service. The product itself is the greatest selling point, so continuously working to improve it will keep users hooked on what is coming next.

5. Privacy and Ethics:

The Nutritrack app will take care to prevent possible hacking of user data and to ensure that users consent before we intentionally share any of their data. In addition to storing meal history, tracking health ratings, and maintaining billing information, we could expand our access to identifiable information about users through future integrations with other apps. For these reasons, we would take steps to ensure the coding of our app leads to the security of all user data

with secure encryption. There will be a capacity for incognito use of the app as well, to do our part towards providing responsible AI for our users.

The user agreement will have an opt-in component for sharing data with groups such as healthcare organizations; without consent, we will not sell user data in any way. We will also be proactive about planning the protection of user financial information when setting up the infrastructure for subscriptions to paid plans. Ultimately, concerning privacy, our main goal is that Nutritrack's actions match the expectations and preferences of our users while maximizing our opportunities to sustain, innovate, and expand our business.

There are important ethical considerations specific to developing an app falling into the category of Diet and Nutrition apps. According to Ryan (2022), traditional "dietary apps" may negatively impact their users by explicitly or unintentionally claiming authority over dietary choices, competing with access or motivation to explore other sources of health information, and nudging users to engage in specific behaviors that may be more beneficial for the app owner than the user. We will take care in how we market and advertise this app to not overstep the bounds of our general knowledge about health to avoid any risk of obedience to our 'authority.'

In our vision, individuals will be able to track their intake in the context of their personal nutrient needs. In our communications to users, whether through marketing materials, app design, or user agreement, we are prioritizing striking a balance between transparency about the process of rating dishes and encouraging users to be critical thinkers and consumers of that information. They must recognize the app is for entertainment purposes and not medical advice, such that any insights the app may provide should empower the users in the context of their health journeys as defined by them, their physicians, and their nutritionists. As we evolve, we intend to encourage users to customize their usage of Nutritrack by using personalized information from sources they trust, generated on wearables such as Fitbit and similar devices, in conjecture with our service.

To create our initial grades for meals in this prototype, we researched what is and isn't healthy for the average person without specialized needs based on medical diagnoses. In the future, prior to going to market, we would absolutely consult with doctors and nutritionists to ensure what we are presenting is as useful for users as possible. We believe it may be possible in the future to

add nuance to our calculations, and options suited to individual users. For now, we are using ideal macro ratios for fat-to-protein, and carb-to-protein, of 0.5 - 2.0, with a loss of points due to very high fat-to-protein and/or carb-to-protein ratios. This system will be communicated to users through the user agreement so that they can implement their discretion about whether our model is useful based on their personal health needs and goals.

6. Social Impact:

There are broader implications for both users and society as a whole. For individuals, benefits include greater accountability for follow-through on doctor- or nutritionist-recommended diets as well as personally defined goals. There will be opportunities to share and celebrate success in community, and to be inspired by others' efforts to live healthily.

There are opportunities to expand globally given the role of food in joining diverse communities. As we grow, we would like to train on more images of dishes specific to a plethora of ethnicities and cultures to ensure that all users of Nutritrack have a quality experience that is both beneficial to their health and satisfactorily entertaining, but also so people can befriend likeminded individuals from other countries and learn about new dishes to support their health goals.

One resource we are interested in adapting into our model is crowdsourced data from multiple regions globally using the Open Food Facts database, with additional images and information about nutritional content. This database is accessible by API and claims to have been so influential that it has impacted individuals' "dietary habits, research, policymaking, and the overall landscape of the food industry" (Open Food Facts, n.d.).

7. Legal and Regulatory Issues:

Nutritrack is prepared to address potential legal challenges in the realms of compliance, safety, and intellectual property rights.

Regarding compliance, the actual legal user agreement will state that the app is intended for entertainment purposes, with usage for health decisions at the prerogative of the user alone. The app is a game, not a medical device requiring FDA approval, and provides no medical or health

advice. Users will recognize that Nutritrack does not collect information about their health conditions, allergies, or prescribed diets. To use the app, they will agree that Nutritrack is not responsible for user violations of directions from their users' medical providers or nutritionists. In addition to documenting how the ratings are formulated, the user agreement will advise that the health grade ratings are not paired with individualized recommendations or requirements.

With regards to safety, users will need to commit to not holding Nutritrack liable for ingestion of either edible or inedible substances depicted in any user-submitted images. The agreement will require them to acknowledge that Nutritrack is not responsible should they become ill or suffer from any negative consequences such as poor taste, indigestion, choking, poisoning, weight gain, fatigue, or other effects of dietary choices.

Finally, for intellectual property rights, Nutritrack would obtain trademarks for the name and logo, and copyrights for the code and design of the app as is typically done by other apps (WIPO, n.d.). The intellectual property protections sought by other types of companies such as patents are less relevant in our context.

8. Scalability:

To remain relevant, there must be constant innovation; there cannot be growth in our user base without the continued growth of Nutritrack itself. Engineering new in-demand features and capabilities will ensure the best user experience, which starts with our training models.

Machine learning models have a tough time getting to 100% accuracy, especially in image detection, but we are committed to striving for the highest possible success by continuously training new models. Building new ML models that could outperform our current status quo will always be a headlining action item because the excellence of our training model is the biggest selling point within our product.

The app will need to be regularly upgraded to the best and newest cloud infrastructures to enhance user privacy and retention of all the app's data given the immense levels of data flowing through the app. Scaling these cloud features as the app grows will be critical to ensure that all our insights are kept safe.

The next technically scalable action is the user interface. All the most popular apps are always changing their UX to keep up with user needs such as convenience, so there is always a greater experience on the horizon. This could range from designs within the app itself or the order in which things are placed to give greater importance to the items that are used the most often.

Beyond technicalities, growing a business itself is vital to continue the success of the app. Providing the app on as many platforms as possible such as iOS, Android, and the web will cast a wide net to access many customers. The good thing about going with software is that anyone can access it around the world, but there could be greater expansions of how the app is used in different countries to meet their needs. This would be much further down the line, once there has been enough success in the original key market to try expanding to more questionable markets.

Growth could also take place within the app to provide features that don't necessarily keep our current functionality at the center. The app could address everything food-related, such as meal planning, grocery listings, and where the best deals can be found in the surrounding area. This goes a step beyond what is already planned, but it could be what people want the most, so it's important to position ourselves by being fluid.

There are also the social aspects that were mentioned earlier, of having a community on the app where items can be shared between users, which could grow to be the biggest value by connecting people in another way outside of the platforms we already have as a society.

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