Personalized Diet Recommendation

By:

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ABSTRACT

Nutrient plays a crucial role in maintaining good health, and personalized dietary guidance can help individuals achieve optimal nutrition. However, traditional on-size-fits-all approaches to nutrition may not take into account individual differences in dietary needs, genetic makeup, and lifestyle factors. To address this challenge, we going to develop an AI-powered personalized diet recommendation system that provides tailored dietary guidance to individuals based on their unique characteristics. Our model integrates data from multiple sources, including dietary surveys, lifestyle information, and genetic data, to predict an individual's nutritional requirements and provide practical recommendations that can be easily implemented in their daily lives. Our personalized nutrition model has the potential to revolutionize the field of nutrition and improve health outcomes for individuals around the world.

PROBLEM STATEMENT

The challenge is to create a machine learning model that accurately predicts an individual's nutritional needs based on various inputs, and generates practical recommendations that can be easily implemented for improved health outcomes.

DATASET

To make the model, we can make use of [this dataset available on Kaggle](). This dataset is from National Agency for Food, Environmental and Occupational Health Safety of France

Dataset attributes: -

It contains over 3000 foods classed over three groups levels:

• Groups

• Subgroups

• Sub Subgroups

With full compositions with average quantities for more than 70 nutrients with:

• Water

• Macros

• Fats

• Vitamins

• Minerals

Moreover, additional datasets can be found here:

1. https://www.kaggle.com/datasets/niharika41298/nutrition-details-for-mostcommonfoods

2. https://www.kaggle.com/datasets/thedevastator/healthy-diet-recipes-acomprehensivedataset

3. https://www.kaggle.com/datasets/ulrikthygepedersen/fastfood-nutrition

BUSINESS SEGMENTATION

Demographic Segmentation:

Age: Different age groups have varying nutritional needs and dietary preferences. Teenagers may focus on growth and development, while young adults might be more concerned with weight management or athletic performance. Middle-aged individuals may prioritize overall health and disease prevention, and seniors may have specific nutritional requirements to support aging well.

Gender: There may be gender-based differences in nutritional goals and dietary preferences. For instance, females may require additional nutrients during pregnancy or menopause. Understanding these differences helps tailor app features and content accordingly.

Location: Geographical factors can impact dietary habits and preferences. Different regions may have distinct culinary traditions, local produce availability, or cultural dietary restrictions. Consider adapting the app to accommodate these regional differences and provide relevant nutritional information.

Psychographic Segmentation:

Health Consciousness: This segment includes individuals who prioritize their health and actively seek information and tools to maintain a healthy lifestyle. They may engage in regular exercise, monitor their nutrient intake, and strive to make informed dietary choices.

For this segment, the app can focus on providing in-depth nutritional information, personalized meal plans, and tracking features.

Lifestyle: Different lifestyles can affect nutritional needs and preferences. Busy professionals may require quick and convenient meal options, while athletes may need specialized nutrition plans for optimal performance. Individuals with dietary restrictions, such as vegans or those following gluten-free diets, would benefit from tailored recipes and ingredient substitutions.

Attitudes and Beliefs: Understanding attitudes and beliefs related to nutrition can help segment users based on their values and preferences. Some individuals may prioritize organic or locally sourced foods, while others may be motivated by sustainable eating practices. The app can cater to these preferences by offering organic food guides, sustainable sourcing information, or carbon footprint tracking features.

Behavioural Segmentation:

Usage Frequency: Segmenting users based on their app usage patterns can help identify highly engaged users and those who may need additional encouragement. Regular users can be targeted with loyalty programs, rewards, or personalized recommendations, while less active users may benefit from targeted reminders, notifications, or incentives to increase engagement.

Goals and Motivations: Users have different nutritional goals and motivations. Some may be focused on weight loss, muscle gain, or improving specific health conditions. By understanding these goals, the app can offer relevant features such as calorie tracking, personalized meal plans, workout integration, or condition-specific nutrition guides.

Purchase Patterns: Analysing user's purchasing behaviour within the app can help identify segments that are more likely to make in-app purchases or subscribe to premium features. These segments can be targeted with special offers, exclusive content, or personalized recommendations to drive conversions.

MARKET SEGMENTATION

Market segmentation for a nutrient app involves dividing the overall market into distinct groups or segments based on specific characteristics and needs. These segments enable the app to target and tailor its marketing efforts to different customer groups effectively. Here's an explanation of the market segmentation for a nutrient app:

Demographic Segmentation:

Age: Segmenting the market based on age helps identify the unique nutritional requirements and preferences of different age groups. For instance, the app may target teenagers who are

focused on healthy eating habits for growth, or seniors who require specific nutrients for agerelated health concerns.

Gender: Gender-based segmentation recognizes the differing nutritional needs and goals between males and females. The app can provide specialized content and features addressing gender-specific concerns such as prenatal nutrition for females or muscle-building guidance for males.

Location: Geographical segmentation acknowledges the regional variations in dietary habits, cultural practices, and food availability. The app can adapt its content to cater to specific locations, offering regional recipes, local ingredient information, or nutritional guidance tailored to the local cuisine.

Psychographic Segmentation:

Health Consciousness: Segmenting based on health consciousness allows the app to target individuals who prioritize their well-being and seek nutrition-related information. This segment may include fitness enthusiasts, health-conscious individuals, or those managing specific health conditions.

Lifestyle: Segmentation based on lifestyle considers factors such as dietary preferences (e.g., vegan, vegetarian), fitness levels, activity levels, or specific dietary restrictions (e.g., gluten-free, lactose intolerant). The app can provide personalized meal plans, recipe recommendations, and nutrition tracking features to meet the unique needs of these segments.

Attitudes and Beliefs: Segmenting based on attitudes and beliefs related to nutrition helps the app understand customers' values and motivations. For example, some segments may prioritize organic foods, sustainable sourcing, or ethical eating practices. The app can provide information and features that align with these values, such as organic product recommendations or sustainable food guides.

Behavioural Segmentation:

Usage Patterns: Segmentation based on usage patterns involves categorizing users based on their frequency of app usage, engagement level, and interaction with app features. This segmentation helps the app identify highly engaged users, occasional users, and inactive users. Targeted marketing efforts, personalized notifications, and rewards can be used to increase engagement among different segments.

Goals and Motivations: Understanding the goals and motivations of users helps tailor the app's features and content to address their specific needs. Segments can include individuals aiming for weight loss, muscle gain, managing specific health conditions, or improving overall

well-being. The app can offer personalized nutrition plans, goal tracking, and relevant content to support these goals.

Purchase Behaviour: Segmenting based on purchasing behavior helps identify users who are more likely to make in-app purchases or subscribe to premium features. These segments can be targeted with promotions, discounts, or exclusive content to drive conversions and increase revenue.

Socioeconomic Segmentation:

Socioeconomic segmentation is a type of market segmentation that divides the market based on the socioeconomic status of customers. It takes into consideration factors such as income level, occupation, education, and social class. By understanding the socioeconomic characteristics of customers, businesses can better tailor their marketing strategies to meet the needs and preferences of different socioeconomic groups.

Here are some key aspects of socioeconomic segmentation:

Income Level: Customers can be segmented based on their income, such as high-income earners, middle-income earners, and low-income earners. This segmentation helps businesses offer products and services at different price points and cater to the purchasing power of each income segment.

Occupation: Different occupations may have distinct needs and preferences. For example, professionals in managerial positions might have different buying behaviors compared to blue-collar workers. By segmenting based on occupation, businesses can customize their marketing messages and offerings accordingly.

 Education Level: Education level is often associated with knowledge, attitudes, and aspirations. Customers with higher levels of education might have different interests and priorities compared to those with lower levels of education. Segmenting based on education allows businesses to target specific customer groups with tailored marketing communications.

Social Class: Social class refers to a person's position in society based on factors such as income, occupation, and education. It reflects a person's lifestyle, values, and consumption patterns. Businesses can segment the market into different social classes, such as upper class, middle class, and lower class, to better understand and cater to the specific needs and preferences of each segment.

Benefit Segmentation:

Benefit segmentation is a type of market segmentation that groups customers based on the specific benefits they seek from a product or service. It focuses on understanding the needs, desires, and problems that customers want to address when making purchasing decisions.

By identifying distinct benefit segments, businesses can tailor their marketing strategies to effectively communicate the value and benefits of their offerings to each segment.

Here are some key aspects of benefit segmentation:

Identifying Benefits: The first step in benefit segmentation is identifying the different benefits that customers seek from a product or service. These benefits can be functional (e.g., convenience, reliability), emotional (e.g., status, excitement), social (e.g., belonging, recognition), or self-expressive (e.g., personal style, identity). By understanding the specific benefits desired by different customer segments, businesses can position their offerings accordingly.

Segmenting by Benefits: Once the benefits are identified, customers can be segmented into groups based on their primary motivations and preferences. For example, in the automotive industry, customers may be segmented into segments seeking safety features, luxury and comfort, fuel efficiency, or performance. Each segment represents a distinct group of customers with specific benefit preferences.

Tailoring Marketing Messages: Benefit segmentation helps businesses develop targeted marketing messages that emphasize the benefits most relevant to each segment. By communicating how their product or service fulfills the specific needs and desires of a particular segment, companies can create more compelling and persuasive marketing campaigns.

Product Customization: Benefit segmentation can also drive product customization and development. By understanding the unique needs of different benefit segments, businesses can create variations of their offerings to better meet those needs. This might involve developing different product features, packaging, pricing options, or bundling strategies for each segment.

Market Positioning: Benefit segmentation informs market positioning by identifying the key benefits that differentiate a product or service from competitors in the minds of specific customer segments. By focusing on specific benefits that resonate strongly with target segments, businesses can position themselves as the preferred choice for fulfilling those needs.

GLOBAR DIET AND NUTRITION APPS MARKET SIZE

The Global Diet and Nutrition Apps Market is projected to grow at a CAGR value of 16.8% from 2022 to 2027.

The growing penetration of mobile apps in everyday life has been instrumental in the growing demand for diet and nutrition apps. Diet and nutrition tracking has been instrumental in the development of the diet and nutrition app market in recent years. The growing number of functionalities such as product scanners, calorie tracking, macro and micronutrient tracking, and activity tracking, among others, are expected to further the growth of the market.

The growing focus on new diets and dietary restrictions among the population has seen an increase in the number of diet-specific apps such as HappyCow which is a vegan diet-focused app. Other apps that have been highly functionalized to provide information and help customers track specific dietary requirements are becoming increasingly popular.

The subscription model has become increasingly popular among app developers. Subscription packages allow developers to provide customized content to customers, generate a steady revenue stream, and allow for greater protection against IP theft. Subscription-based apps are also becoming increasingly popular as they allow customers to conduct trials before completing the purchase and allow for greater flexibility.

Diet and nutrition tracking apps are becoming increasingly popular among mobile application users. As per Apple App Store and Google Play Store data, health and nutrition apps account for 3% of all apps offered. There has been an increase in demand for multi-functional apps with multiple functionalities in recent years as people look for one-stop solutions for all their fitness-related needs.

The diet and nutrition app market has been restrained by the increasing number of pirated apps being circulated. The growing number of apps in the market has increased competition among key players in the market. The growing demand for greater functionalities is expected to increase the cost of the development of diet and nutrition apps during the forecast period.

COVID-19 Impact on Global Diet and Nutrition Apps Market

The COVID-19 pandemic has increased the focus on nutrition and dietary practices among the population. The peculiar nature of the disease and the need to improve health conditions have led to an increase in demand for diet and nutrition apps. The growing percentage of people working from home has led to a greater number of people turning to dietary discipline to combat their growing sedentary lifestyles.

Ukraine-Russia War Impact on the IT Industry

Ukraine has been a major player in the IT industry in Europe owing to the availability of highly skilled programmers and developers at a lower cost. The conflict between Ukraine and Russia has in many ways led app developers to turn away from Ukraine for outsourcing their work. The withdrawal of major corporations from conducting business in Russia is expected to reduce the revenue generated by the diet and nutrition apps within Russia and Ukraine.

Global Diet and Nutrition Apps Market: By Type

The activity tracking segment is expected to be the largest diet and nutrition apps market segment based on the type. Diet and nutrition apps have increased functionality through activity tracking. The growing demand for tracking calories expended and calories consumed from various foods has led to the rapid growth in demand for the activity tracking segment.

The exercise & weight loss segment is expected to be the fastest-growing segment in the market. The growing number of apps that are being released for tracking exercises, the growing adoption of Fitbit and smartwatches for tracking physical activities, and the growing demand for customized exercise plans are expected to result in the rapid growth of the exercise & weight loss segment.

Global Diet and Nutrition Apps Market: By Platform

The android segment is expected to be the most prominent market segment based on the platform. The large number of android users and the cost-effectiveness of android devices have led to the domination of this segment over iOS. Android devices offer greater functionality and easier release of apps which has also led to the growing availability of android-based diet and nutrition apps.

The iOS segment is expected to be the fastest-growing segment in the diet and nutrition apps market, based on the platform. The growing demand for apple devices, increased expenditure on the development of iOS-only apps, and greater protection against IP theft in apple devices are expected to result in the rapid growth of the iOS segment during the forecast period.

Global Diet and Nutrition Apps Market: By Device Type

The smartphones segment is the largest market segment, based on the device type. The large and growing number of smartphone users, increased visibility, and greater functional support offered by smartphones has led to the development of the smartphones segment.

The growing adoption of smartwatches and Fitbits, increasing investment in wearable medical devices, and the growing demand for integration of various wearable devices with diet and nutrition apps are expected to result in the rapid growth of the wearable devices segment.

Global Diet and Nutrition Apps Market - Industry Trends and Forecast to 2028

Global Diet and Nutrition Apps Market, By Type (Nutrition Tracking App, Activity Tracking App, Social Platform Apps, Wager Apps, and Others), Products (Smartphones, Wearable Devices, Tablets), Gender (Women, Men), Age (Adults, Teenagers, Aged), Platform (Android, IOS, Windows and Others), End-User (Fitness Centers, Healthcare Industries, Homecare Settings, and Others), Country (U.S., Canada, Mexico, U.K., Germany, France, Spain, Italy, Netherlands, Switzerland, Russia, Belgium, Turkey, Rest of Europe, China, Japan, South Korea, India, Australia, Singapore, Thailand, Malaysia, Indonesia, Philippines, Rest of Asia-Pacific, South Africa, Saudi Arabia, U.A.E., Egypt, Israel, Rest of the Middle East and Africa) Industry Trends and Forecast to 2028.
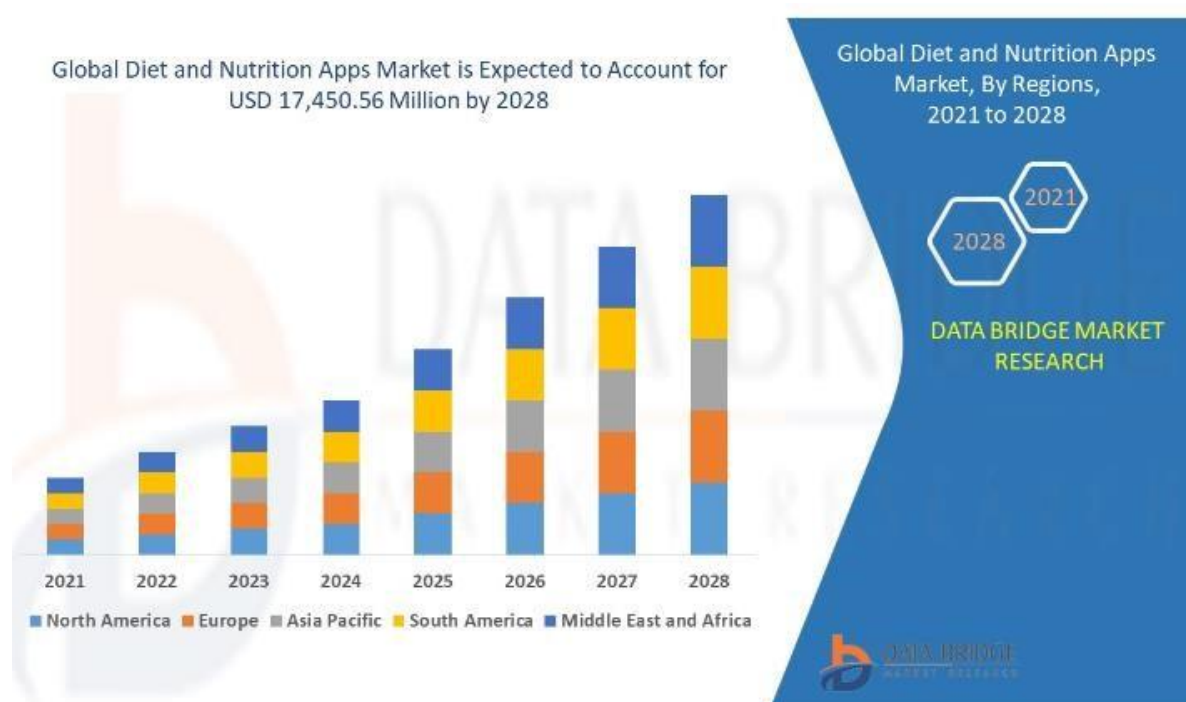

Fig. 1

Market Analysis and Insights: Global Diet and Nutrition Apps Market

Diet and nutrition apps market is expected to grow in the forecast period of 2021 to 2028. Data Bridge Market Research analyses that the market is growing with a CAGR of 30.4% in the forecast period of 2021 to 2028 and is expected to reach USD 17,450.56 million by 2028.

The diet and nutrition apps are software applications used for tracking nutritional intakes and managing diets for healthy eating, weight loss, weight maintenance, weight gain, and fitness. Diet apps are also in demand for healthcare to track food sensitivities, allergies, and medical conditions, such as diabetes, high blood pressure, and heart disease. These app tools are offered in devices such as smartphones, tablets, and PCs. In recent years, the increased internet penetration and other digital services such as cloud computing have boosted the digital platform offering market. Mobile phone applications are used as tools by many users to get help in their daily tasks. Increasing awareness about health disorders due to unhealthy lifestyles has led to increased diet and nutrition apps.

The major factors driving the growth of the diet and nutrition apps market are the increasing penetration of digital devices and the internet, growing awareness regarding health and wellness, and scientific advancements in nutrition. Increasing use of smartphone apps owing to a surge in individuals with higher personal innovativeness is creating opportunities for the market's growth. Inconsistencies in nutrient coding are acting as the major restraint for the diet and nutrition apps market. Lack of awareness regarding specific functionalities and capabilities of nutrition apps is acting as a major challenge for the market's growth.

This diet and nutrition apps market report provides details of market share, new developments, and product pipeline analysis, the impact of domestic and localized market players, analyses opportunities in terms of emerging revenue pockets, changes in market regulations, product approvals, strategic decisions, product launches, geographic expansions, and technological innovations in the market. To understand the analysis and the market scenario, contact us for an Analyst Brief; our team will help you create a revenue impact solution to achieve your desired goal.
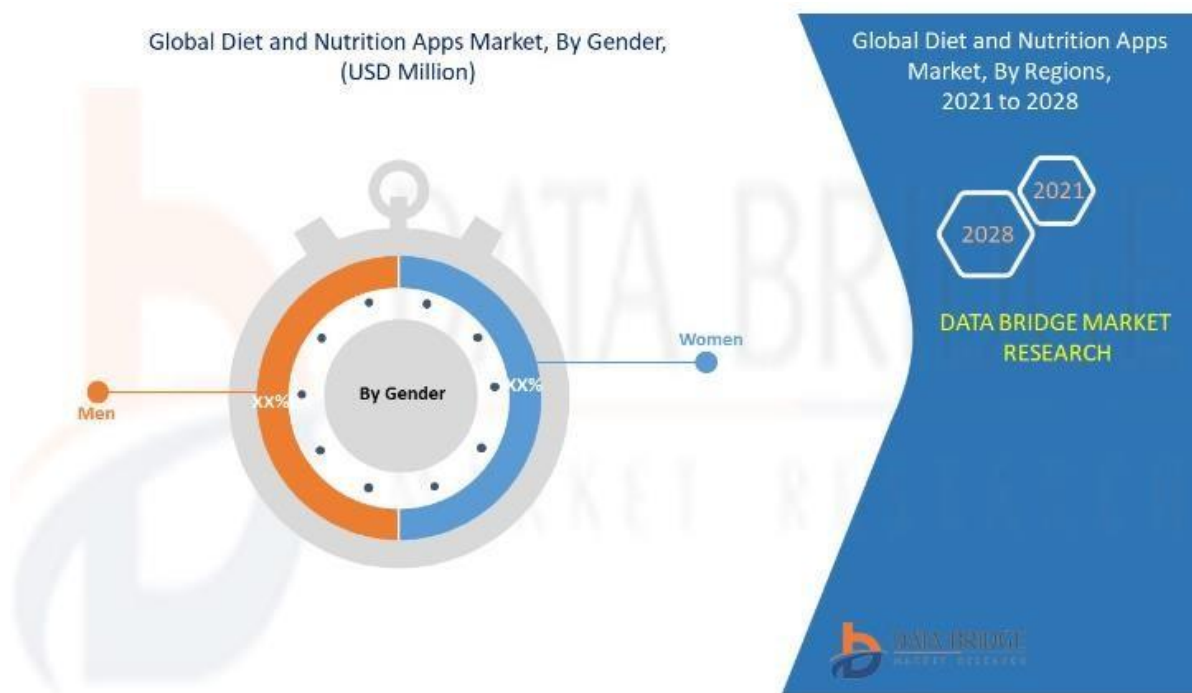
Fig.2

Global Diet and Nutrition Apps Market Scope and Market Size

The global diet and nutrition apps market is segmented based on type, products, gender, age, platform, and end-user. The growth among segments helps you analyze niche pockets of growth and strategies to approach the market and determine your core application areas and the difference in your target markets.

On the basis of type, the global diet and nutrition apps market is segmented into nutrition tracking app, activity tracking app, social platform apps, wager apps, and others. In 2021, the nutrition tracking app segment is expected to dominate the market as individuals have become more concerned about healthy eating and are using apps to track the nutrients present in food for a better healthy diet. Moreover, the nutrients tracking system also helps determine the most optimum food diet to choose as an alternative source of the product.

On the basis of products, the global diet and nutrition apps market is segmented into smartphones, tablets, and wearable devices. In 2021, the smartphone segment is expected to dominate the market as smartphones are more user-friendly and easy to install apps. The phone can be carried anywhere and can be used to track activities and nutrition intake throughout the day. Moreover, the adoption of smartphones has increased over the years, leading to a high market share.

On the basis of gender, the global diet and nutrition apps market is segmented into men and women. In 2021, the women segment is expected to dominate the market as the women use nutrition apps for better diet control and prepare healthy food through healthy food recipes.

Moreover, it has been observed that women are more concerned about a healthy diet than men to maintain adequate body weight. In contrast, men are more inclined towards physical activities and workouts and are less focused on dieting apps.

On the basis of age, the global diet and nutrition apps market is segmented into teenagers, adults, and the aged. In 2021, the adult segment is expected to dominate the market as adults are more concerned about the nutrition and diet benefits, majorly using the diet and nutrition app. The adult population is adopting a healthy lifestyle to avoid chronic diseases such as obesity and diabetes.

On the basis of platform, the global diet and nutrition apps market is segmented into Android, iOS, Windows, and others. In 2021, the android segment is expected to dominate the market as android has witnessed high popularity in emerging economies, where price remains an important factor in consumer's smartphone purchase decisions. Android is also more userfriendly as compared to other platforms and thus cater higher market share.

On the basis of end-user, the global diet and nutrition apps market is segmented into fitness centers, home care settings, healthcare industries, and others. In 2021, the fitness centers segment is expected to dominate the market as the growth in virtual fitness coaching has increased drastically over the pandemic, and most coaches are using online nutrition monitoring apps. Fitness centers have also seen significant growth due to the increasing concern of people towards their health.
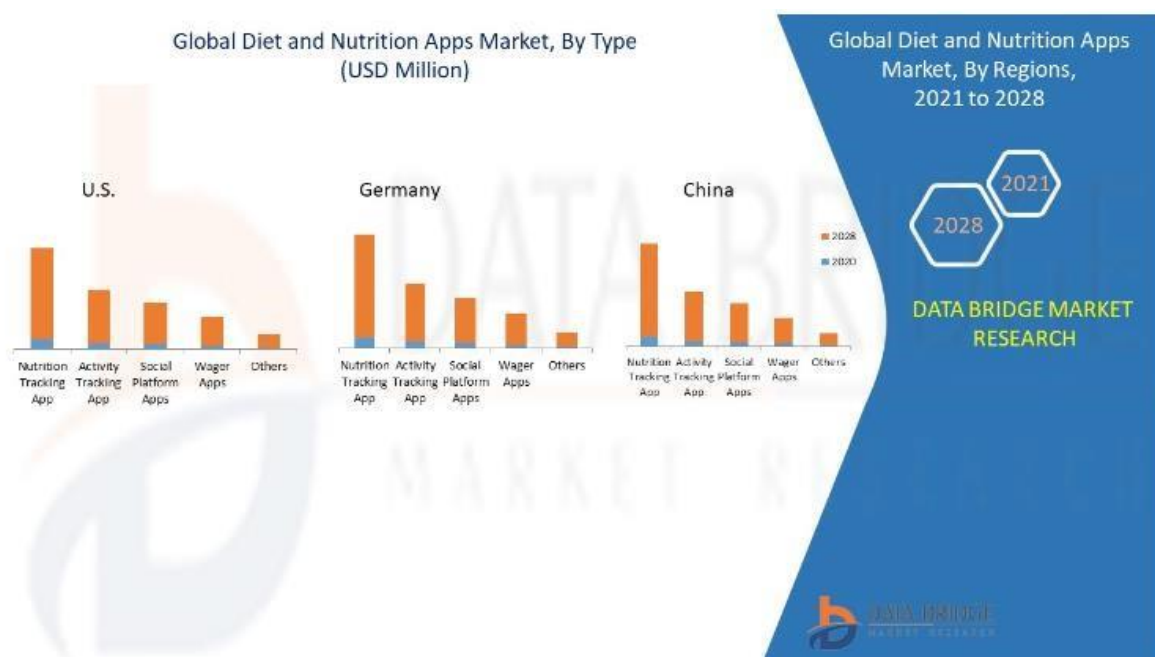

Fig. 3

Global Diet and Nutrition Apps Market Country Level Analysis

Global Diet and nutrition apps market is analyzed, and market size information is provided by country, type, products, gender, age, platform, and end-user.

The countries covered in the global diet and nutrition apps market report are the U.S., Canada, Mexico in North America, U.K., Germany, France, Spain, Italy, Netherlands, Switzerland, Russia, Belgium, Turkey, Rest of Europe in Europe, China, Japan, South Korea, India, Australia, Singapore, Thailand, Malaysia, Indonesia, Philippines, Rest of Asia-Pacific, South Africa, Saudi Arabia, U.A.E., Egypt, Israel, Rest of the Middle East and Africa.

The North America is the dominating region. In 2021, North America is expected to dominate the market due to the high presence of top players in the region. The region has high adoption of smartphones that the users use as a platform for diet and nutrition apps. Moreover, the population is highly concerned about their eating habit and the nutrients present in their food.

The U.S. accounted for the maximum share in the diet and nutrition apps market due to a large number of dominating and local players in the region. Germany accounts for the second largest market as the region has witnessed high growth in population concerned about a healthy lifestyle. China has witnessed fast growth in the adoption of smartphones and penetration of the internet in the region used for apps.

The country section of the diet and nutrition apps market report also provides individual market impacting factors and changes in market regulation that impact the current and future trends of the market. Data points such as new sales, replacement sales, country demographics, regulatory acts, and import-export analysis are some of the major pointers used to forecast the market scenario for individual countries. Also, the presence and availability of global brands and their challenges faced due to large or scarce competition from local and domestic brands, the impact of sales channels are considered while providing forecast analysis of the country data.

BUSINESS MODEL

Here are the key components of the business model:

1. **Software Development:** The core of the business model is the development of an AIpowered personalized diet recommendation system. This involves creating algorithms and machine learning models that can analyze user data, such as dietary preferences, health conditions, activity levels, and goals, to generate customized meal plans and dietary recommendations.

2. **Data Collection:** To provide personalized recommendations, the system needs to collect data from users. This can be done through various means, such as mobile apps, websites, or wearable devices. The data collected may include personal information, health metrics, dietary habits, and food preferences. Ensuring data privacy and security is crucial to gain and maintain user trust.

3. **Data Analysis:** The collected data is analyzed using machine learning and AI techniques to identify patterns, correlations, and individual user needs. This analysis helps in generating personalized diet recommendations that align with the user's goals and dietary requirements.

4. **Partnerships:** Collaborating with food providers, fitness companies, or health-related organizations can enhance the value proposition of the personalized diet recommendation system. Partnerships can include integrating with grocery delivery services, collaborating with fitness apps or devices, or working with nutritionists or dietitians to provide expert advice and consultations.

5. **Monetization Strategies:** There are several monetization strategies that can be considered for an AI-powered personalized diet recommendation system:

-   **Freemium Model:** Offer a basic version of the system for free, and charge a premium for additional features or enhanced personalization.

-   **Subscription Model:** Charge a recurring subscription fee for access to the personalized diet recommendation system and ongoing support.

-   **Data Licensing:** Aggregate and anonymize user data to provide valuable insights to food manufacturers, health organizations, or researchers who can use it for product development, research, or market analysis.

-   **Affiliate Marketing:** Partner with food or supplement companies and earn commissions for recommending their products within the personalized meal plans.

-   **Advertising:** Display targeted advertisements within the user interface, based on the user's preferences and goals.

FINANCIAL MODEL

1. Revenue Streams:

a)   Subscription Fees: Determine the pricing structure for different subscription tiers (e.g., basic, premium) based on the level of personalization and additional features offered. Calculate the expected number of subscribers and the monthly or annual subscription fee to estimate the revenue from subscriptions.

b)   Data Licensing: Analyse the market demand for aggregated and anonymized user data. Set pricing for data licensing agreements with food manufacturers, health organizations, or researchers who can benefit from access to the data. Consider the volume of data and the pricing model (e.g., per dataset, recurring license fee).

c)   Affiliate Commissions: Collaborate with food or supplement companies and earn commissions for recommending their products within the personalized meal plans. Estimate the potential number of purchases and the commission rate to calculate the revenue generated from affiliate marketing.

d)   Advertising Revenue: If you plan to display targeted advertisements, estimate the ad impressions, click-through rates, and advertising rates to calculate the expected revenue from advertising.

2. User Acquisition and Retention Costs:

a)   Marketing Expenses: Determine the budget for digital marketing channels, including social media ads, search engine marketing, influencer collaborations, or content marketing campaigns. Estimate the cost per acquisition (CPA) based on historical data or industry benchmarks, and multiply it by the expected number of acquired users to calculate the marketing expenses.

b)   User Engagement and Retention: Allocate a budget for user engagement strategies, such as regular content creation, personalized notifications, or loyalty programs. Estimate the cost of implementing these strategies and factor it into the equation.

3. Development and Maintenance Costs:

a)   Development Team: Calculate the salaries and benefits of developers, data scientists, AI specialists, and any other team members involved in software development. Consider the number of employees and their average monthly or annual compensation.

b)   Infrastructure and Hosting: Estimate the costs of cloud hosting services, server maintenance, and any other infrastructure expenses required to support the personalized diet recommendation system.

c)   Maintenance and Updates: Allocate a budget for ongoing maintenance, bug fixes, and updates to enhance the system's performance and ensure its compatibility with evolving technologies.

4. Operational Costs:

Consider general overhead costs, including office rent, utilities, administrative expenses, customer support costs, legal and accounting fees, and any other operational expenses necessary to run the business.

5. Scalability and Growth:

Factor in the costs associated with scaling up the system to accommodate a growing user base. This includes infrastructure scaling, hiring additional team members, and any other investments required to support business expansion.

The mathematical representation of the financial equation for an AI-powered personalized diet recommendation system:

Net Income = (Subscription Revenue + Data Licensing Revenue + Affiliate Commissions + Advertising Revenue) - (User Acquisition Costs + Development and Maintenance Costs + Operational Costs + Scalability Costs)

Let's assign variables to each component:

Let:

SR = Subscription Revenue

DLR = Data Licensing Revenue

AC = Affiliate Commissions

AR = Advertising Revenue

UAC = User Acquisition Costs

DMC = Development and Maintenance Costs

OC = Operational Costs

SC = Scalability Costs

The financial equation can be written as:

Net Income = (SR + DLR + AC + AR) - (UAC + DMC + OC + SC)

This equation calculates the net income or profitability of the AI-powered personalized diet recommendation system by summing up the revenue streams and subtracting the costs associated with user acquisition, development and maintenance, operations, and scalability.

RETURN ON INVESTMENT

Return on Investment (ROI)

Return on investment (ROI) is the key measure of the profit derived from any investment. It is a ratio that compares the gain or loss from an investment relative to its cost.[21]

$$ROI = \frac{\text{Net Return on Investment}}{\text{Cost of Investment}} \times 100\%$$

Fig. 4