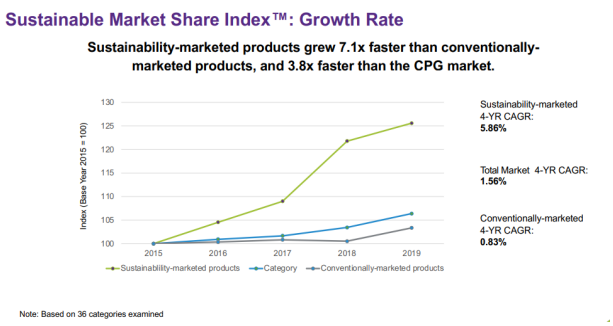
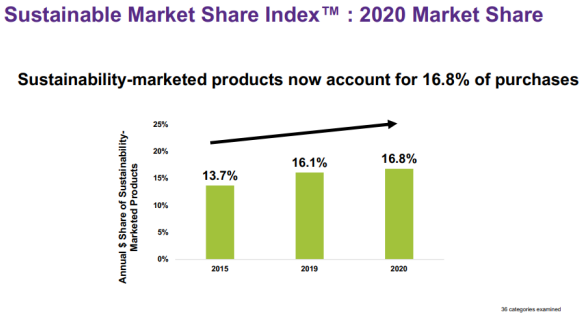
Problem Statement for SITAC -2022

Driving personal sustainability for environmental change

Climate change is being touted as the next big threat to humanity. Responding appropriately to climate change is one of the key pillars of a sustainable future and is one of the 17 Sustainable Development Goals (SDGs) issued by the United Nations.
As organizations and individuals are getting sensitized to the issue, they are starting to leverage technology to make choices that will help address the problem.
Governments and business organizations are working on multiple aspects of sustainability and climate change, building solutions to help measure environmental footprint and achieve a carbon neutral/net-negative status.
Choosing sustainable options not only helps create a positive environmental impact but also real business impact and drives growth for an organization. This is reflected in the growth of sustainably marketed products which has witnessed a 7.1X growth compared to conventional marketed products from 2015 to 2019. As a result, the share of sustainable marketed products as a % of purchase is increasing and now accounts for ~16.8% of purchases.





source: NYU stern, center for sustainability research

The opportunity: The success of organizational efforts (government or private) depends essentially on the awareness, participation, and commitment of individuals.
To drive sustainability practices at an individual level, there aren't many technology solutions available today.
Some factors that impact the development of a solution

- Lack of clarity on environment impact and SDGs
- Lack of awareness on actions one can take to make a difference
- Lack of ways to correlate and measure individual actions in the context of broader climate change and organizational efforts

Even with an awareness of the issue and knowledge of potential actions and impact, one of the big challenges is 'motivation to act'. This is because the action we will take today will have an impact/change a decade later -- i.e., lack of instant gratification. This has resulted in lack of real participation so far from individuals.

Any effective approach to a solution will require drawing on multiple disciplines of technology and human understanding:

- Fundamental psychological principles to motivate people
- Motivational techniques to cause behavioral change towards “Habits” that are beneficial
- Gamification of the practices and principles for engagement through fun
- Use of ubiquitous technologies like mobile, cloud, machine learning and social media
- Leveraging community formation among practitioners
- Technology based solutions can help drive and scale the impact. As we think about a technology solution, it should aim to do three things:
    - Generate awareness
    - Drive action
    - Measure Impact

1) Generate awareness: Increase awareness to generate intentions to act
    a. Provide credible and simple to consume information on sustainable future
    b. Explain Why it is important to act NOW
    c. Explaining COST of doing NOTHING
    d. Explaining HARM done by making wrong choices
2) Drive Action: Provide a list of small actions consumers can take in their daily lives to convert intention to action. Some of the use cases include:
    a. Sustainable Shopping:
        i. Eco-friendly clothing
        ii. Food
    b. Sustainable usage of utilities
        i. Electricity <e.g. smart thermostat>
        ii. Water
        iii. Reduce, Reuse, and Recycling
    c. Sustainable Travel
        i. Local travel – walk v/s car
        ii. Eco friendly routing <Google maps example>
        iii. Choice of eco-friendly Airline provider
3) Measure Impact
    a. Measure direct impact in terms of $$$ savings: fuel savings, energy bill savings
    b. Measure indirect impact of sustainable choices (organic clothing) in terms of Do-Good points and provide a mechanism to leverage the points to do good <e.g., tentree clothing brand plants ten trees for every item bought>

Psychological concepts that can be leveraged as part of the solution:

- Gamification through Do-Good points: People can form groups and participate in Daily/Weekly/Monthly Challenges to earn more Do-Good points or badges to display on personal/professional social networks
- Make actions easy and enjoyable
- Intrinsic motivation v/s extrinsic motivation
- Nudge/Notifications: Reminders to use reusable coffee cups, reusable water bottles, and reusable grocery bags
- Science of Habit Formation: Cue Craving Response Reward

Key Features:

- Profile Creation/Login: Ability for users to do a secure login, create a profile for self and household, enter usage patterns for utility, preferences for shopping, etc.
- Sustainable Actions/Recommendations:
    - Ability to gather user inputs (through product barcode scan, travel itinerary, usage patterns) and provide sustainability info along with more sustainable alternatives
    - Personalized Recommendations: AI/ML driven personalized recommendations for sustainable actions in daily life based on usage/shopping patterns of users, for e.g., personalized product/brand recommendations, travel flight/route recommendations, usage recommendations, etc.
- Goal/Challenge Creation:
    - Ability for users to enter their own sustainability goals
    - Ability for users to create daily/weekly/monthly sustainability challenges for other users to participate
    - Ability to share goal completion data with others to stimulate healthy competition
- Data/Analytics:
    - Ability to integrate with 3P partners via APIs for gathering data/methodology on brands' sustainability ratings, flights' carbon emissions, etc.
    - Ability to analyze data from several daily actions and measure overall sustainability score/ Do-good points, carbon savings/$$ savings, etc.
    - Ability for users to track progress towards daily goals in a visual dashboard
    - Ability for users to view their lifetime environmental impact, previous goal completions
    - Ability for users to analyse and dive deeper into statistics for group challenges
- Social/Communication Platform:
    - Instant Messaging: Ability for users to communicate 1:1 privately with other members as well as form groups of members with shared interest or goals
    - Social Feed: A social network where users can post updates publicly and view others 'updates
- Other features: Personalized notifications

Key Architectural Requirements:

- The solution must be implementable in the cloud
- System should work for all popular browsers and mobile operating systems
- Users should be able to access the system through a mobile device or desktop
- Encryption of data to ensure privacy and legal requirements such as GDPR, CCPA, etc. for Personally Identifiable Information of users in USA
- Appropriate security mechanisms to protect data in transit as system may require linking with State Government websites for information exchange
- Ability to support very large number of users (up to 100K users in 1-2 years scaling to 10s of Millions of users in 4-5 years) and associated data requirements

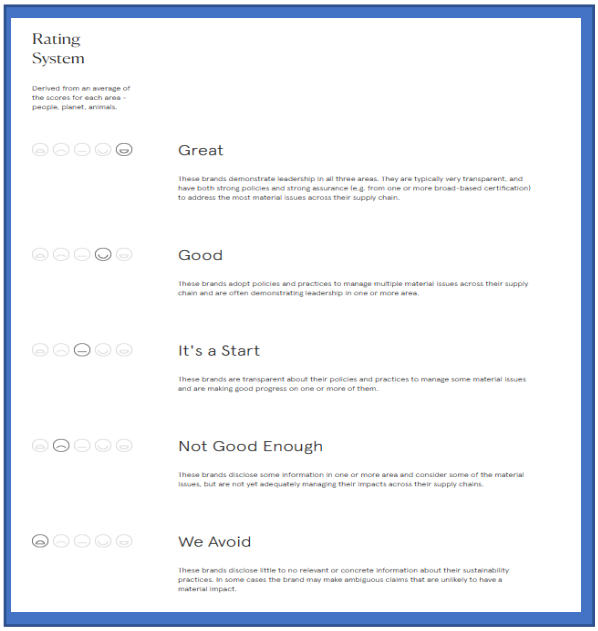
Illustrative snapshots:

Provide Procedural knowledge of sustainable actions

Entry-Level Variables	Ownership Variables	Empowerment Variables
Environmental Sensitivity	In-depth knowledge about environmental issues	Knowledge of/skill in using environmental action strategies (Procedural Knowledge)
Environmental Knowledge	Knowledge of consequences	Locus of control/Self-efficacy
	Personal investment in issues/personal responsibility	Intention to act

Scan barcode, learn ingredients, spot dirty ingredients, and shop cleaner options

Good on you reviews and ratings



References:

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3) Top 12 Business Sustainability Issues and Topics (nbs.net)
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