POLITECNICO DI TORINO

Master of Science degree in
Systemic design “Aurelio Peccei”

Master’s Degree Thesis

Interaction design for behavioral changing focus on overweight treatment of young adults in colombia

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1. INTRODUCTION

Through the years there has been the question about why do people do what they do? For that topic, exist a good and a simple answer, it's called "behavior". The word behavior means the way that somebody reacts or behaves in a particular situation (Oxford, 2015).
The human behavior isn't permanent, as a result it could be programmable and the main thing you just need to know is how to code it.

Nowadays the traditional product design aim isn't about building good products that work well and people like using. In the XXI century people are requiring more because are involve in a world with huge range of possibilities, for that reason they are looking for products with value added. Designing for behavior change is about building products that are both good and behaviorally effective–products that help people change their behavior, its goal is to help people do things that they want to do but have struggled with in the past (Wendel, 2015).

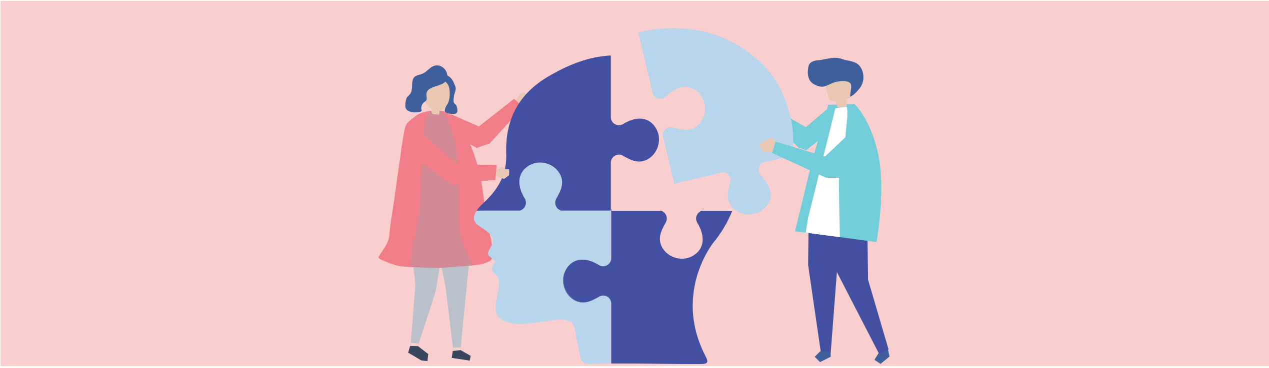
Sometimes the designers seek to create new experiences for their customers, waiting that they use every day, may be even multiple times per day, but they aren't awareness about the straightforward stuffs, their users have busy lives. They are constantly worried about their jobs, their studies, their friends, their kids, their social media and there are a thousand of examples. The point is that already exist a method which can improve their daily life by creating new behaviors or changing those that already exist.

Behavior design is the result of the connection of different topics like behavioral economics, psychology, persuasive technology, data analysis, product development and UX. Moreover, have many applications in different fields such as health and well-being, safety, social design, environmental sustainability and commercial purposes.

The last decades, there has been a tremendous flowering of research on biases and heuristics, that are well established, but the research on how products can help change the behavior is still in its infancy. Furthermore, exist an issue in the uniformity of terms and methods applied for the behavior design.

At the Politecnico di Torino is used the methodology of interaction design, with the research of this document it can be added some behavioral design concepts to enhance the experience and change behaviors.

The focus problem in this thesis is regarding the overweight in Colombia, where more than half of adults (56%) is in excess weight.
Currently, overweight disease is worked by particularly areas of expertise like nutrition, physical activity and mental health where there is little connection in each component to provide a complete and interactive treatment to patients in the health system. As a solution to the argument mentioned before, a new application called gee thanks of an interdisciplinary professional team offers personalized treatment to their patients with behavioral change strategies such as social incentives and points, which are used to feedback and reinforce people's progress with the output data recollected by the app.

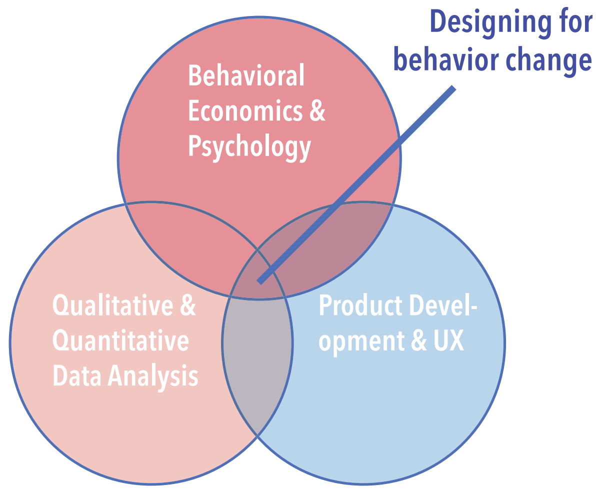


2. LITERATURE REVIEW

The roots of behavior design integrate behavioral science research, product design, expertise and data analysis. It's not enough understand how the mind works.

To support the process of behavioral science research requires two sets of skills. The first is a plan for data analysis (both qualitative and quantitative), after that information is recollected there is a refinement and iteration based on that data. The second skill is adding metrics to the application and conducting user research to understand individual behavior, analyzing the data, and making improvements over time based on it (Wendel, 2015).

FIGURE 1. The ingredients for designing for behavioral change



2.1 BEHAVIORAL ECONOMICS

Behavioral economics (BE) is a field of study that attempt to understand how humans make decisions through the lens of psychological, behavioral, emotional, and social factors (Ariely, 2010). Contrary to dominant theories of economics, BE posits that people are irrational, meaning that cannot be provide simple information and expect people to act on it accordingly. Additionally, explores human behavior exclusively through the lens of decision making, and believes humans make decisions on the basis of cognitive shortcuts (heuristics) that often result in 'irrational' decisions. These heuristics are incredibly sensitive to how choices are framed, revealing opportunities to 'nudge' people's decisions by adjusting this framing (Bridgeable, 2018).

2.2 BEHAVIORAL DESIGN

As it was mentioned before, the principles of behavioral economics are important to understand the core of behavioral design, which is defined as:
"A framework for intentionally and systematically changing human behavior through persuasive modifications of the physical and digital environment." (Combs, 2018)
Combs in his book unpacked the keywords of the definition for a better understanding in this way:

•It's a **"framework"**: is a set of ideas that describe and predict how and why people behave the way they do. It's also a set of practices for changing those behaviors.
•It's **"intentional"**: Behavioral Design is about designing how people behave. The goal of the design is deliberate specific behavioral results through the product or service.
•It's **"systematic"**: The ideas and methods that make up Behavioral Design were not randomly chosen: they are rooted in observations and experiments from psychology, neuroscience, and behavioral economics.
•It's about **"change"**: It contains ideas and tools for changing small behaviors and large behaviors. Behaviors that the design team wants people to start doing and stop doing.
•It's about **"persuasion"**: Behavioral Design uses insights about how the brain operates as for strategies persuading people to change their behaviors. It is not about coercion. It is not about forcing people to change.
•It's about the **"environment"**: Behavioral Design changes how people behave by changing their environment.

2.3 HISTORY

Behavioral Design is in a fledgling moment of technical, scientific, and cultural evolution. Nowadays people is taking account the behavioral principles to be added in the process production and in the product's use, they are taking care of their costumers habits.
It's important to do a thorough back in the past to understand this innovative design sub-type.

Much of the scientific groundwork for the ideas and techniques inside Behavioral Design were outlined in the 1950s and 60s. In 1880s Norman's introduce concepts from ecological psychology and human factors research to designers, such as affordance, constraint feedback and mapping, it was called "Norman's psychology of everyday things", but their work didn't focus in influencing behavioral change.

The first academic formalization of Behavioral Design as a Design Framework came in the 1990s and early 2000s. New concepts in works from S.Green & Jordan regarding emotional design and by Foggs about persuasive technology bloomed.

However since 2005, a great number of theories have taken the path of designing for behavior change, creating diversity methods, guidelines and toolkits for its implementation in new creations. With the emergence of the notion of behavior change, more discussion has begun since 2012, because exist a lack in the common terminology, in the research protocols and in the methods employed, these are current issues that still happening today. Also exist problems in selecting which designing for behavioral change might be applied, how should be the influence implicit or explicit; and not least the ethical consequences of the behaviors.

Furthermore new scientific and technological trends have appeared and have created a behavior change in our society, these are:

- Ubiquitous Smartphones
- Advances in Computational Neuroscience
- Cloud Computing
- Free, Open-source and Artificial Intelligence

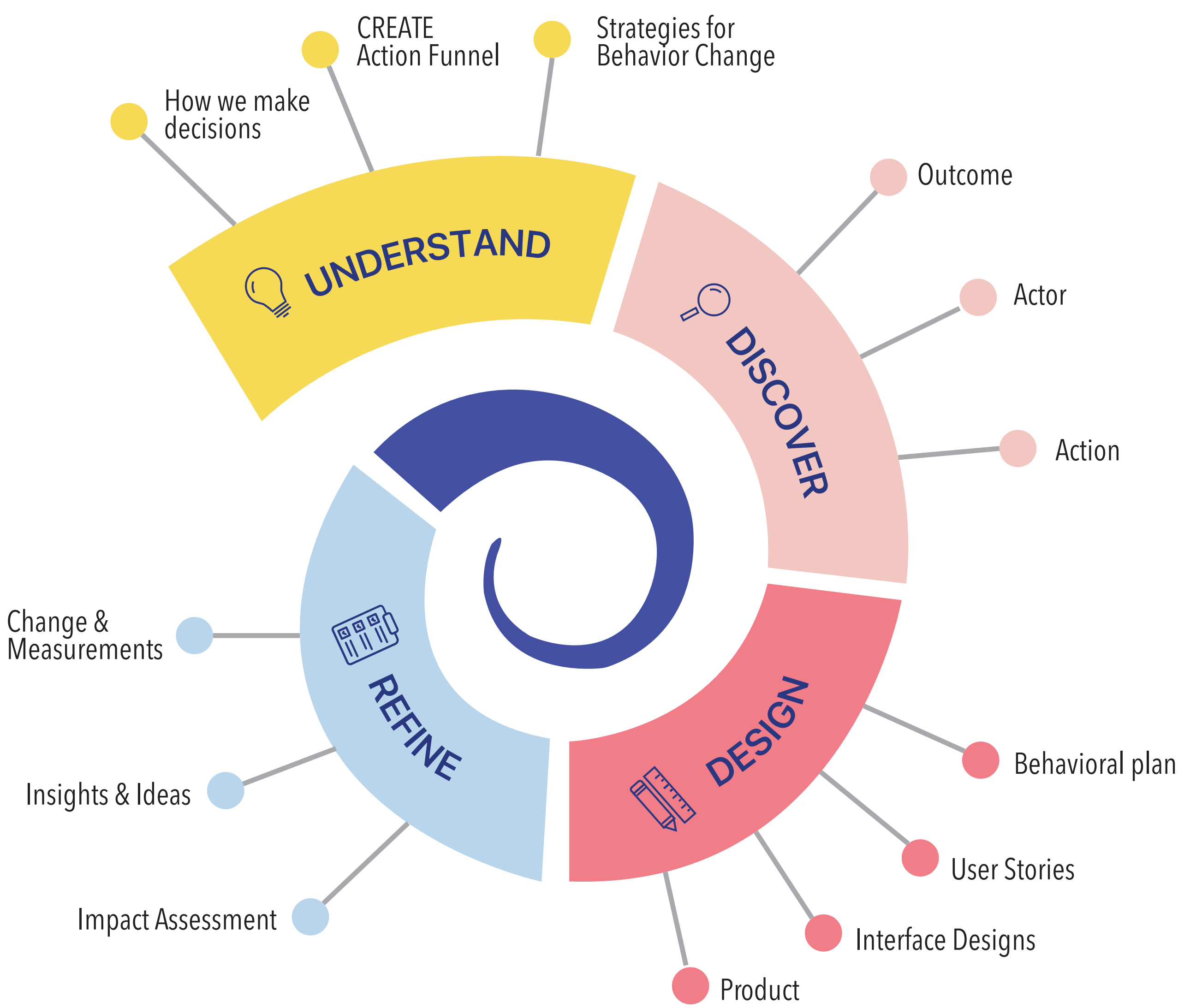
3. METHODS

The focus of this chapter is about exposed two current methods for designing for behavioral change, these methods are different in the way they are applied but have some steps in common and also similar terminology.

3.1 METHOD DESIGNING FOR BEHAVIOR CHANGE BY WENDEL

This first method and his information was taken from the book Designing for behavioral change written by Stephen Mendel in 2013. He created a spiral process that is divided in four stages:
1. Understand how the mind decides to act and what that means for behavior change
2. Discover the right behaviors to change, given goals for the company and users.
3. Design the product itself around that behavior
4. Refine the product's impact based on careful measurement and analysis

FIGURE 2. Shows the specific outputs that the design team will generate within each stage of the process.

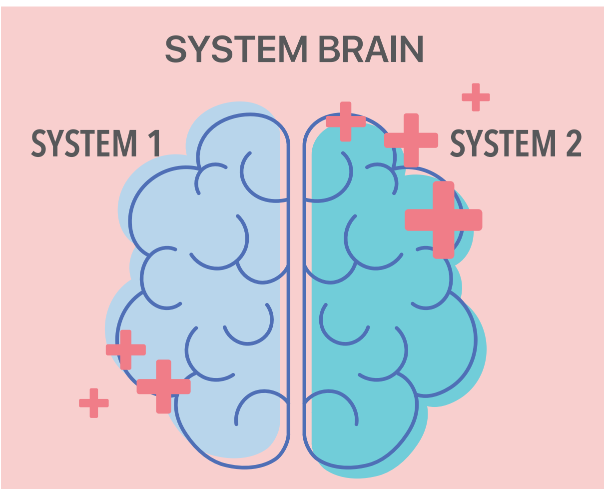


3.1.1 UNDERSTAND

To begin is important to know about the two different types of behavior that exist:

• The first one is **behaviors that users want to change within their daily lives.** Some examples are: Controlling diabetes, paying off credit card debts, getting back in shape and getting involved in their communities;
• The second one is **behaviors within the product itself that are part of using the product**. Some examples of behaviors that occur within software are: Organizing mails contacts, drawing decent flowcharts and formatting documents.

On the other hand is substantial to comprehend how the mind makes decisions, the humans have two modes of thinking in the brain, one is deliberative and the other is intuitive:



• **The intuitive mode** (or "emotional" mode; it's called "System 1") is blazingly fast and automatic, but generally people are not conscious of its inner workings.
Most of the daily behavior is governed by the intuitive mode. They are acting on habit (learned patterns of behavior), on gut instinct (blazingly fast evaluations of a situation based on past experiences), or on simple rules of thumb (cognitive shortcuts or heuristics built into their mental machinery).
"Researchers estimate that roughly half of our daily lives are spent executing habits and other intuitive behaviors, and not consciously thinking about what we're doing" (Wood, Quinn, & Kashy, 2002) (Dean, 2016)

• **The deliberative mode** ("conscious" mode or "System 2") is slow, focused, and self-aware and is consider "thinking". It's the way to rationally analyze unfamiliar simulations, and handle complex problems with System 2.

HABITS

Habits are outstanding because they drive intuitive behaviors in predictable ways.
To make clear, a habit is a repeated behavior that's triggered by cues in the environment. It's automatic–the action occurs outside of conscious control.

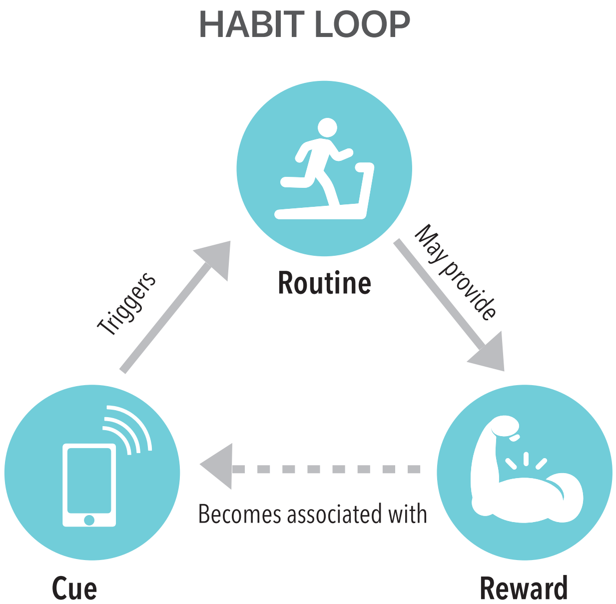
Habits save minds work. Habits arise in one of two ways (wood & Neal, 2007):
First, a habit can be built by simple repetition: whenever you see X (a cue), you do Y (a routine). Secondly, sometimes there is also a third element, in addition to a cue and routine: a reward, something good that happens at the end of the routine. The reward pulls forward–it gives a reason to repeat the behavior.

• **The cue** is something that tells you to act now. The cue is a clear and unambiguous signal in the environment (like the smell of coffee) or in the person's body (like hunger).

• **The routine** can be something simple (hear phone ring, answer it) or complex (smell coffee, turn, enter Starbucks, buy coffee, drink it), as long as the scenario in which the behavior occurs is consistent.

• **The reward** can occur every time–like drinking the favorite brand of coffee–or on a more complex "reward schedule". A reward schedule is the frequency and variability with which a reward occurs each time the behavior occurs.

FIGURE 3. The cue-routine-reward process described (Duhigg, 2012). For example, seeing the scale in the morning triggers the exercise routine. The immediate reward is a pleasant muscle burn.



Another relevant factor is the way the mind is constantly saving work, for that reason is avoiding work whenever is possible through the habits and other intuitive reactions.

When the mind is confronted with hard problems it can't immediately solve, it often substitutes a different, easier problem, solves that, and acts like it was the original one.

Moreover, the folks have terribly limited attention, limited short-term memory, and limited and easily depleted willpower. That's not to say people are stupid or weak, instead, the minds find creative ways to work around the biological limits.

OUR PEERS PROVIDE ANSWERS

One of the most important and common ways that the minds save work is by looking at what other people are doing, these are some examples:

• Judge the value of a product or action by whether other people seem to like it (it's called social proof).

• Judge the value of a product or action by whether "experts" recommend it (even without knowing if they were paid to recommend it).

• Judge when take an action based on whether the person perceive the action is common in his social group

THE SIMPLE, OBVIOUS STUFF MATTERS.

Designers have known this for a long time. Generally, everybody likes new experiences with products that are easy and beautiful. Also the things that seem familiar are more comfortable than new and strange ones; people don't want to fail and finally, urgent things will be done before things that aren't urgent.

A MAP OF THE DECISION-MAKING PROCESS

Wendel described a range of ways by which the mind decides what to do next–from habits and intuitive responses to heuristics and conscious choices. Table 1 list where each of these decision-making processes often occurs.

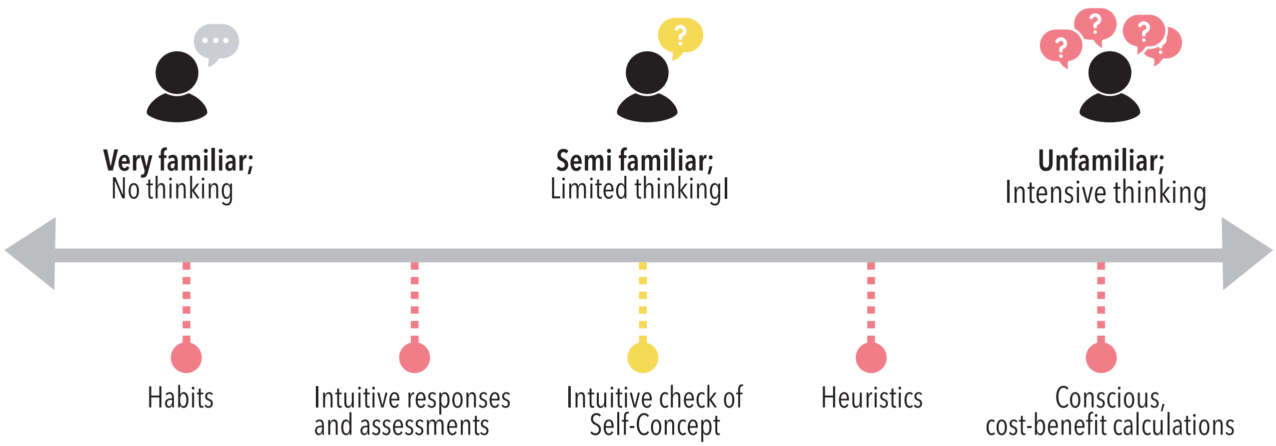
TABLE 1. The various tools the mind uses to choose the right action

Mechanism	Where is most likely to be used
Habits	Familiar cues trigger a learned routine
Other intuitive responses	Familiar and semi-familiar situations, with a reaction based on prior experiences
Active mindset or self-concept	Ambiguous situations with a few possible interpretations
Heuristics	Situations where conscious attention is required, but the choice can be implicitly simplified
Focused, conscious calculation	Unfamiliar situations where a conscious choice is required or very important decisions that direct the attention toward.

SPECTRUM OF THINKING INTERVENTIONS

It's possible to think about the range of decision-making processes in terms of the "default, lowest energy way" that the minds would respond, if the person didn't intentionally do something different, those defaults occur on a spectrum from where very little thinking is required to where intensive thinking is needed (Wendel, 2015).

FIGURE 4. Spectrum of thinking interventions. In familiar situations the mind can use habits and intuitive responses to save work.



THE CREATE ACTION FUNNEL

From a research literature to identify the preconditions that need to be in place for a person to take a specific action, is divided in five different stages:

- **Cue:** The thought of taking the action needs to somehow cross the person's mind.

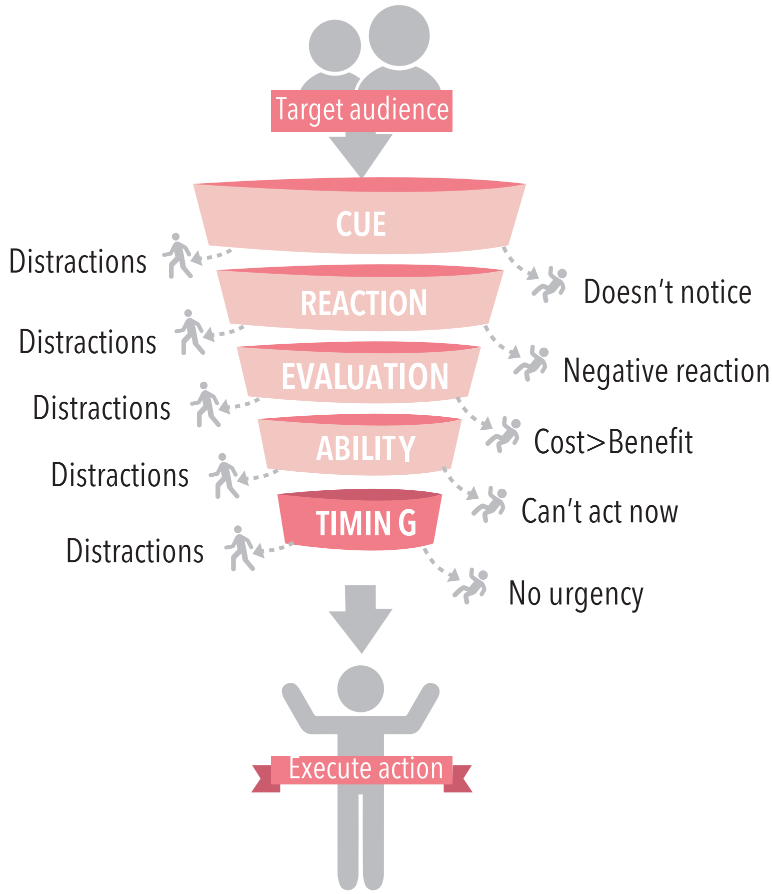
- **Reaction:** In the blink of an eye, the automatic, intuitive self-reacts to the idea. It checks whether the action is relevant and interesting at all. It generates an emotional response. It activates and starts to consider other possible actions that the person might take.

- **Evaluation:** If the action isn't intuitively discarded, it can bubble up to conscious awareness for a cost-benefit analysis: how hard will the action be to take, what's the action's value for the user, etc. The mind would evaluate other alternatives as well and determine the most promising action.

- **Ability:** If the action is worthwhile (benefit > cost, and more than the alternatives), the person must actually be able to act. Ability has many levels: the person must know logistically what to actually do, have the resources to do it, and must not be dissuaded by the assumption of failure. If the user faces obstacles, often they can be resolved, but that process takes time and leaves the person open to distraction.

- **Timing:** The person needs to have a reason to act now, rather than doing something else that is more urgent. That reason can range from external emergencies (the car is about to crash) to internal disequilibrium (hunger, thirst).

FIGURE 5. The Create Action Funnel–the five stages that a potential action has to pass in order to be undertaken.



At each step of the way in the Create Action Funnel, people drop off–because they fail to see the cue, don't consider the action worthwhile, or don't find it urgent. Each step of the way, they can also become distracted and diverted into taking other actions.

These are some tips described by Wendel about each stage:
• Each Stage Is Relative: The person only continues on if the action is more effective or better than the alternatives.
• Each Stage Is Personal: Whether or not a particular action passes a stage of the action funnel depends on the person, and on the particular situation.
• The Funnel Repeats Each Time the Person Acts: People don't stay in the funnel over time. They drop out somewhere, or they take the action.
• Each Time Through the Funnel Is Different: Each time a person thinks about taking a target action, he passes through the Create.

Strategies to help people to pass through the Create Action Funnel, these are:

• **The use of brute force** method is necessary to support the user's conscious decision to act, each and every time the user should take the action.
•**Build habits,** which rely on the automatic, intuitive part of the mind. With habitual behavior, the evaluation and timing parts are usually skipped over, making it more likely that the person will take the action.
• **The "cheat" strategy**–by shifting the burden of work from the user to the product, so that after the user gives consent; the user doesn't need to act. That inverts the Create Action Funnel and makes inaction work to the user's benefit.

3.1.2. DISCOVER

The second stage of Wendel's process is the Discover. The goal of this stage is to determine what's the right thing to build.

Designing for behavior change builds upon a clear understanding of the target outcome, action, and actor:
• **The outcome** is what will be different in the real world when the product is successful.
• **The action** is how the actor will do it–the behavior the actor will undertake.
• **The actor** is who will cause that change (the actor is usually the user of the product).
It's paramount to clarify each of these three things in order to find problems early in the development process.

Ideally, the outcome should be a tangible, real-world impact. There's a natural tendency to think about the impact on users' emotions, awareness, or knowledge–things that are inside users' heads. It's better to move beyond that, into the practical impact on people's actual behavior and the world around them.
The outcome is the company's concrete and measurable aim that it hopes to accomplish with the product. It's fundamental to answer some probing questions to explicate the outcome:
• **Which type?**
Does the product ultimately seek to change something about the environment (e.g., clean water) or about people (e.g., healthier bodies)
• **Where?**
What is the geographic scope of the impact (e.g., Chesapeake Bay)?
• **What?**
What is the actual change to the environment or person (e.g., decrease nitrogen pollution)?
• **When?**
At what point should the product have an impact? It's important to looking for the order of magnitude. Unlike the others, this doesn't need to be precise at this point– "in a few months" or "in five years" is fine.

Next, the company should clarify exactly how the actors are going to make that outcome happen. If the outcome is improved health, then are users supposed to exercise more or eat better? If the company isn't sure what the best action is for their users, this process can help:

1. Generate a set of ideas: The team can brainstorm ideas on its own, or use questions like these to spark thought: "What does someone do right before the outcome occurs?" "What actions do users already take that are related to the outcome?," "What's stopping users from making the outcome happen?" Direct observation of users to learn how they are already making the outcome happen.

2. Learn about the target users: Write down who the target users are, as specifically as possible: age, gender, location, number of people, and so on. Then should be made some questions regarding the users, like these ones: What's their existing motivation to act? What blocks them? Do they have prior experience with similar actions or with similar products?

3. Generate user personas: For each potential action, segment the user population based on who is going to respond differently to an appeal to act.
For example, people who exercise regularly are going to respond differently than couch potatoes to an appeal to run a half marathon.

4. Evaluate the potential actions: Rate each action according to four criteria: impact (how effectively it will

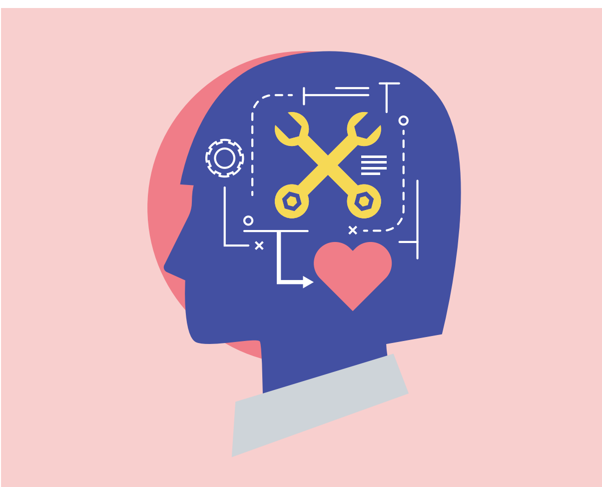
drive the outcome, like health), motivation (how much users currently want to take the action), ease (how familiar the action is to users), and cost (how costly it will be for the company to build a product that supports the action).
Subsequently, having the list of the possible actions is indispensable to look for the minimum viable action in each case. As you know a viable product is the smallest set of features that allows the product to be deployed and tested in the field. In terms of designing for behavior the minimum viable action is the shortest, simplest version of the target action that users absolutely must take to test if the product idea (and its assumed impact on behavior) works.

To finish this stage it is recommended define the success and the failure of the product before build it, because it was already established whom the product is supposed to serve and what actions is trying to drive.

This could be use as example: The product will help 25 to 35-year-old active people in urban areas (actor) track their daily exercise routine (action), to build muscle tone and lose five pounds more per year than they otherwise would (outcome). When successful, it should double our current revenue (company objective).
In this statement, the team is saying: if this happens, the product will be a success; if not, it will be a (complete or partial) failure. In a lean startup environment, it's good generating specific hypotheses around each of these elements, and tests the assumptions in the field.

3.1.3 DESIGN

The third stage is the design; the purpose of this process is to create a context that drives action.



The three different parts of the decision-making context that come together to shape a behavior is: the action itself, the environment, and the user's preparation. These three elements are the way that can influence a behavior, and the Create Action Funnel tells what needs to happen here.

ACTION

Wendel recommends starting by breaking the target action into discrete steps that the user will need to complete depending on his level of expertise and interest.

ENVIRONMENT

To improve the decision-making environment, it could be shape in two senses, by designing the product itself to support action and by helping the user change the broader environment, outside of the product. In each case:

- **Increase motivation** by reminding users their existing reasons to act and, potentially, by providing additional incentives (monetary rewards, social motivations, intrinsic benefits like exploring something new or pulling future motivations into the present).

- **Cue action** by directly asking users to act and encouraging them to set up a cue in their environment.

- **Generate a feedback loop** by providing ongoing status updates about how users are doing so they can adjust their behavior accordingly.

- **Remove competition for users' attention** and behavior by removing distractions within the application, coopting and building upon existing behavior, or competing head-on for users' interest.

- **Remove obstacles** by ensuring that the product is accessible and meets the particular constraints (e.g., reading ability, platform access) of the users.

USER PREPARATION

Now the behavior has been tailored to the users, and the environment has been set up to support that behavior, look how is the best way to prepare the user to take action. There are three tactics:

1. Narrate: Change how users see themselves. Help users see the action as a natural extension of who they are by having them recall similar things they've done in the past and by linking the action to their self-identity. "We can reinterpret what happened to us in the past by changing the stories we tell ourselves about it—our self-narratives" (Wilson, 2015)

2. Associate: Change how users see the action. Make it clear how this action builds upon, and uses knowledge from, other things they've done before. Make a strong connection between the action and other positive things they enjoy (like smelling the fresh cut grass after mowing).

3. Educate: Change how users see the world. Show them logistically what's required to complete the action. Make sure they have all the information they need to act. However, it can be ineffective to use education as a tool for motivation (people probably already know the action is important).

Use the three-step process mentioned before, focusing on the behavior, then the environment and the person, to develop a behavioral plan.

The behavioral plan provides the core functional requirements for the product's behavior-changing aspects and this as a consequence would be the conceptual design for the product.

Furthermore the plan can be articulated in a customer experience map, journey map, textual narrative, or a simple list of bullet points with annotations.

After doing the whole action and behavioral plan, it's time to think about which steps of the process can be simplified by automating, defaulting, or making steps incidental, to remove unnecessary work for the user.
This simplification process allows the team to focus attention on more intractable behavior or more exciting (to the user) parts of the application.

To finalize this stage, the interface designer and other members of the product team develop wireframes or mock-ups of the product. When these are ready, the product team should test them in the field—before committing engineering resources to a full implementation. Wendel said that ideally, should be done with low-cost clickable prototypes—to increase the realism of the experience for users. They should be looking for usability problems, to get gut reactions on aesthetics, to identify missing functionality.
If everything checks out, it's time to build the full product.

3.1.4 REFINE: HOW TO ITERATIVELY IMPROVE THE PRODUCT

The last stage is intended to cover the impact assessment, insight and ideas, and moving deeper into the spiral with changes to the product and measurements of each change in future iterations.

It's important to acknowledge that whenever is design a product that produce any array of human behavior; there will be probably some wrong things. The goal of the refine process is to make the product less wrong, and the skill of improvement can be use. Improving the product proceeds like this:

1. Define clear metrics for the outcome and target action.

2. Measure the impact of the product on the outcome and action. If the outcome isn't directly measurable within the product, develop a data bridge (a statistical relationship between something that can be measured in the app and the outcome the company cares about). The data bridge can come from existing research or a small pilot study conducted by the team or third-party academics.

a. If is possible, run an A/B test or another type of controlled experiment to measure impact. That's the gold standard, and there are numerous tools to help companies run them with online products. Some tools that can be used are: Google Analytics or Kiss metrics. Statistical knowledge is not required.

b. If experiments aren't feasible, the team will need to measure overall impact, then formally or informally control for other things that might influence the users' behavior. Statistical techniques such as matching and the analysis of panel data sets can mitigate these issues but require statistical expertise.

c. A pre-post analysis, choose the differences that were observed and then try to adjust it for all of the other things that could have caused the change that weren't part of the product. The formal version requires running a multivariate statistical analysis like estimating a regression model. The informal version means carefully thinking through what else could have impacted the users and their behavior.

3. Find obstacles to impact by directly observing the users and checking the data for places in the app where they get stuck. A causal map, showing the various pathways by which users can decide to take the target action, can help the team figure out what users are doing and how to best interpret the data.

4. Identify potential solutions, either through user feedback or a set of small, quick tests to diagnose why the problems are occurring. The team can use the Create Action Funnel to target and interpret those quick tests.

5. Prioritize proposed changes to the product designed to improve behavioral impact alongside other proposed changes meant to support business goals, engineering goals, etc.

6. Test each major change. Regardless of whether everyone on the team thinks it's a good idea, check the impact of that change on behavior. Human behavior is just too complex to accurately forecast, and a culture of testing can help check everyone's assumptions.

3.2 METHOD OF DESIGNING FOR BEHAVIOR CHANGE BY BRIDGEABLE

The second method selected was done by Bridgeable, a Canadian company that currently has design behavioral change products and in 2018 created a toolkit, which proposes a framework for designing for behavior change.

Bridgeable's approach is harnessing behavioral economics to design better products and services that nudge users when faced with a decision.

The method presented by Bridgeable was based on Behavioral Economics principles established by the studies of The Center for Advanced Hindsight. Each principles describes at a high level how the majority of people will behave under specific circumstance. In practice, these principles can:

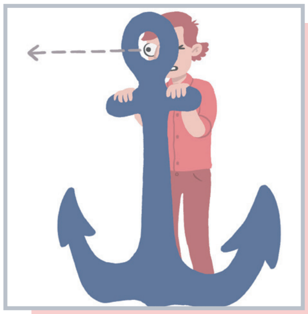
a) Help to understand current behavior
b) Help to change behavior by leveraging relevant BE principles at the right moment of decision making.

As a designer, it can help to think of BE principles as universal research insights, these can describe the underlying currents that the users aren't consciously aware of, but are helping to drive their decisions.

3.2.1 BEHAVIORAL ECONOMICS PRINCIPLES

The Center for Advanced Hindsight studies, designs, tests, and implements behavioral interventions that help people be happier, healthier and wealthier. The CAH created the next list (the next grapghs were designed by Bridgeable):

ANCHORING



The first fact, number, or figure a person hears will bias their judgments and decisions down the line.

AVAILABILITY BIAS

People give undue weight to what easily comes to mind: often-vivid memories or recent events.

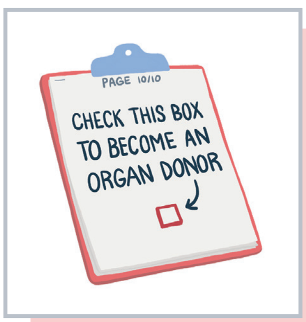
CONFIRMATION BIAS

People analyze and search for information in ways that support their current ideas.

EGO DEPLETION

The ability to make good decisions is a limited resource that can be drained by both decision overload and external fatigue.

DEFAULT BIAS



People pick the easiest option to avoid complex decisions. Defaults provide a cognitive shortcut and signal what people are supposed to do.

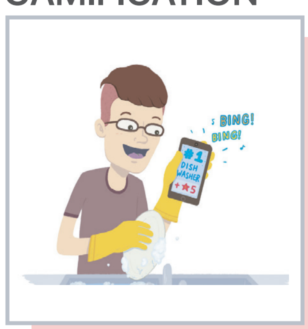
ENDOWMENT EFFECT

People overvalue what they own.

DISPOSITION EFFECT

People have a habit of holding on to poor investments too long and selling good investments too soon.

GAMIFICATION



People like to play games! They will go to great lengths playing a game even if all they get are points.

HYPERBOLIC DISCOUNTING

People put an unrealistically high value on the here and now and an unrealistically low value on the future.

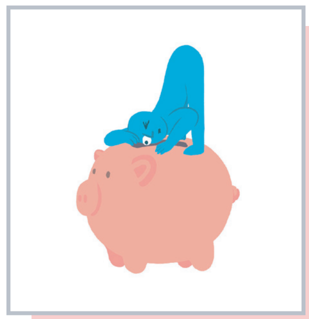
IMPLEMENTATION INTENTIONS

People are more likely to do something when they specify how, when, and where they will do it.

GOAL GRADIENT

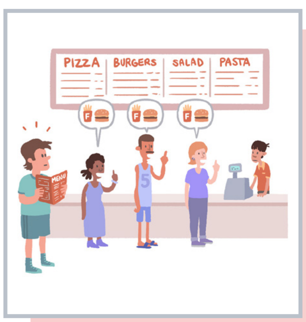
People will work harder to achieve a goal as the goal gets closer.

LACK OF SELF-CONTROL



People have a hard time delaying gratification.

HERDING

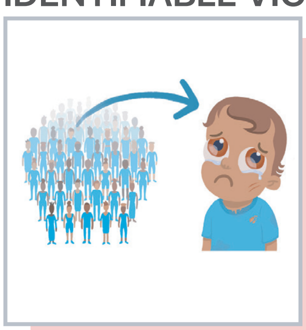


People tend to do what others are doing.

LOSS AVERSION

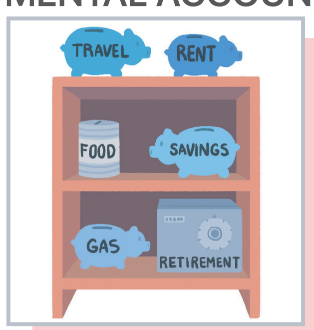
People react to losses more strongly than gains and they try to prevent losses more than they try to make gains.

IDENTIFIABLE VICTIM EFFECT



One identifiable individual, who is described in great detail, evokes deeper emotions and sympathy than does a large group of anonymous individuals.

MENTAL ACCOUNTING



People categorize and spend money differently depending on where it came from and where it is going.

3.2.1 BEHAVIORAL ECONOMICS PRINCIPLES

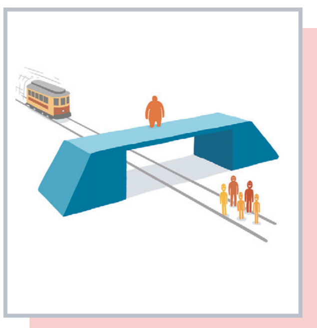
MONEY ILLUSION

People confuse actual dollar amounts with the buying power of dollars.

OSTRICH EFFECT

People who are worried they have fallen o track don't want to know how they're doing.

OMISSION BIAS



People consider harmful actions worse than equally harmful inactions.

OVERCONFIDENCE

Everyone believes they are right and everyone believes they are above average.

OPPORTUNITY COST NEGLECT

People tend to ignore what they give up when they make decisions.

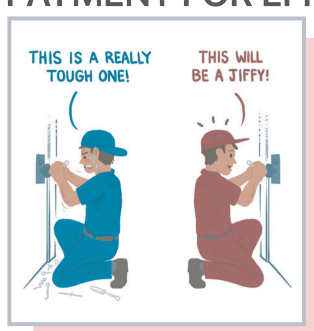
PAIN OF PAYING

Some purchases–such as incremental payments or paying with cash–are more painful than others so people will avoid them.

OPTIMISM BIAS

We overestimate the probability of "things going right for us" and underestimate the probability of "things going wrong for us."

PAYMENT FOR EFFORT



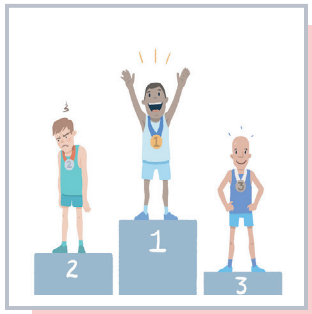
People place a greater value on services and products if they can see the amount of effort put into them.

3.2.1 BEHAVIORAL ECONOMICS PRINCIPLES

PLANNING FALLACY

When planning, people underestimate the resources needed to meet their goals (such as time or level of commitment).

REGRET & COUNTERFACTUALS

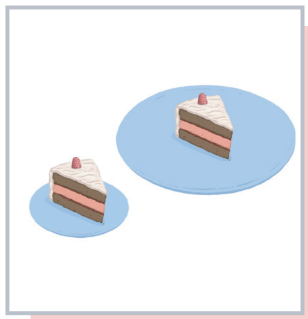


Satisfaction depends both on actual outcomes and ideas about what could have happened.

POWER OF FREE

A price of zero is psychologically much more attractive than any other price, no matter how low.

RELATIVITY



People evaluate options by comparing them to what else is around.

PRE-COMMITMENT

When people actively commit to a goal, they are more likely to achieve it.

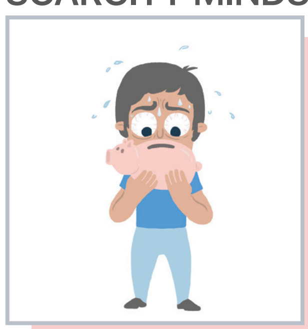
REWARD SUBSTITUTION

Immediate rewards, which appeal to people's impulsive nature, can be used to motivate behaviors that are beneficial in the long run.

RECIPROCITY

People have an inherent desire to help those who have helped them in some way.

SCARCITY MINDSET



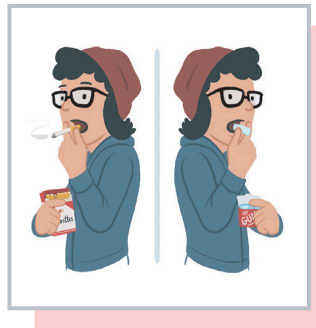
People who lack a resource, such as money, time, or calories, tend to tunnel in on the scarce resource and carry a larger cognitive load.

3.2.1 BEHAVIORAL ECONOMICS PRINCIPLES

SELF-HERDING

People make decisions by asking themselves what they did last time and assume what they already did must have been a good idea.

SUBSTITUTION



It is easier for people to substitute a similar behavior than to eliminate an entrenched one.

SELF-SIGNALING

People behave in ways that reinforce the type of person they believe themselves to be, even if no one else is around to witness it.

TUNNELING

When faced with an emergency, people can only focus on the emergency.

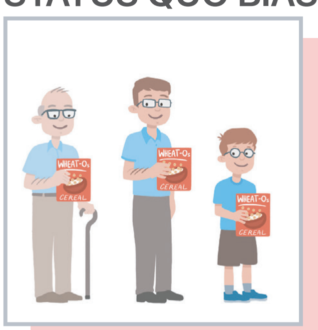
SOCIAL PROOF

People want to be like everyone else and are heavily influenced by what they perceive everyone else is doing.

WHAT-THE-HELL EFFECT

People give up on their goal once they've fallen off track.

STATUS QUO BIAS



People are very committed to keeping things the way that they are.

YOU ARE WHAT YOU MEASURE

People repeat behaviors that are rewarded, regardless of whether those behaviors lead to success.

3.2.2 TRANSLATING INSIGHTS INTO BEHAVIORAL INTERVENTIONS

The Behavioral Economics principles mentioned before can be translating in insights for behavioral interventions, therefore the scientific method is used once again to hypothesize, test, and measure a controlled study that tests a handful of variables at the feature level. Testing variables is akin to what designers know as A/B testing. The scope focuses on testing a few variations of a single feature, looking to see which variant produces the optimal result (Bridgeable, 2018).

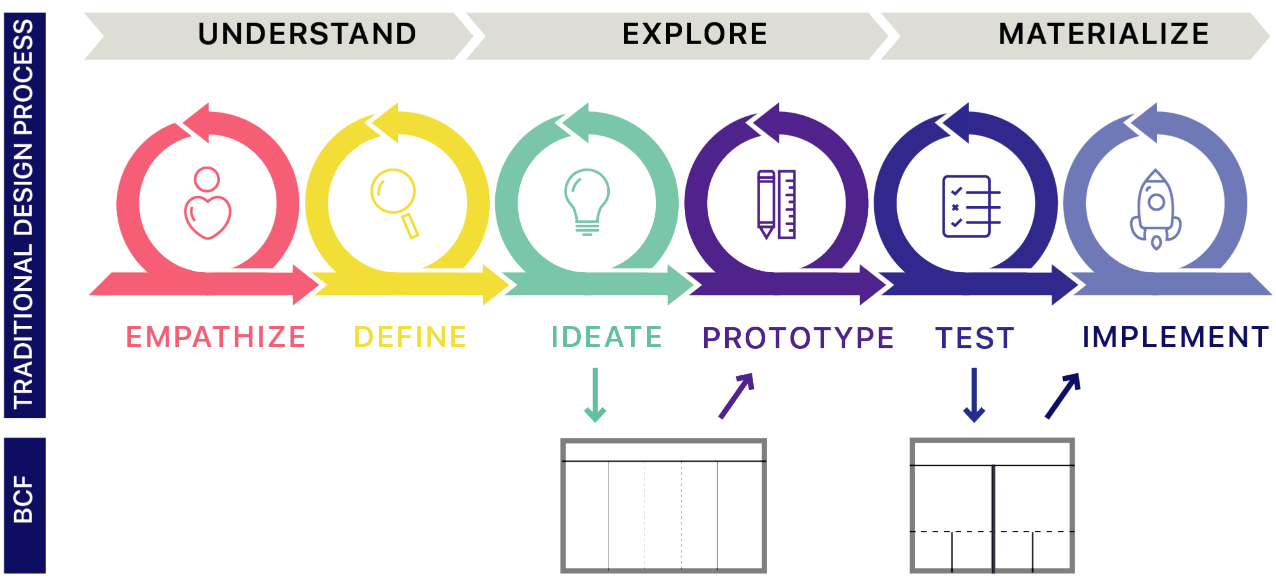
A major advantage of Behavioral Economics is regarding the exponential results, when the principles are applied in the appropriate decision based problem.

3.2.3 BEHAVIOR CHANGE FRAMEWORK

Now it's time to introduce the method develop by Bridgeable, that uses the same process of design thinking, but behavioral design features are applied at touch point levels, it means, in the process of ideate, prototype and test.
Bridgeable called this process "Behavior Change Framework".

The behavior change framework should be use when a product or service is design and requires users change in the way they currently make a decision. This might mean designing to help users adhere new actions in their daily life, such as saving money from each pay cheque, or choose a healthier option for lunch.

FIGURE 6. Behavioral Change Framework process (design process diagram based on framework by Nielson Norman Group)



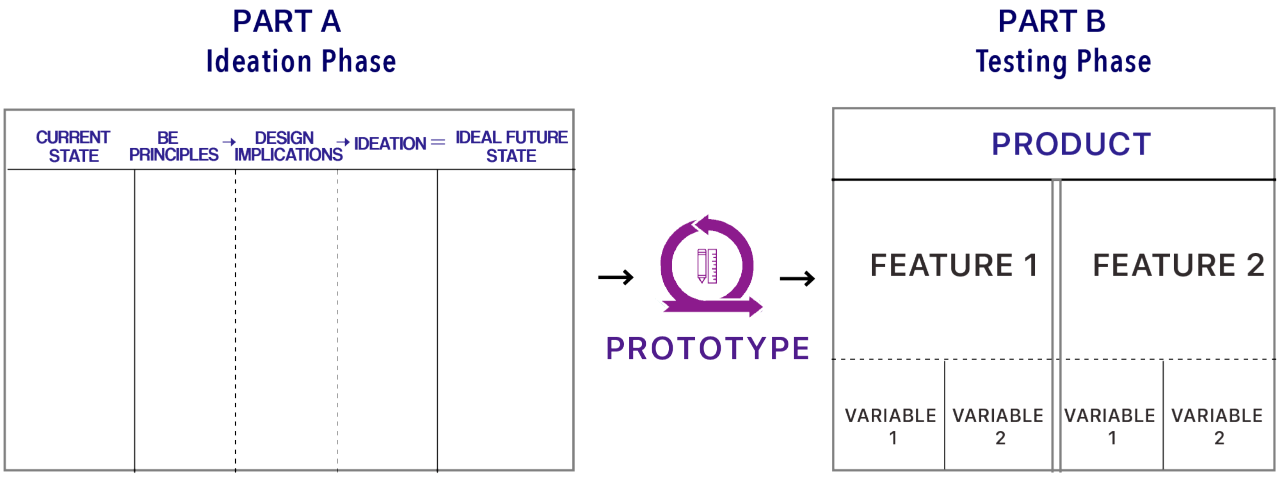
Bridgeable suggest, between the 'ideate' and 'prototype' phases of the design process, you might be use the Behavioral Change Framework (BCF) to identify the best moment for intervention, and develop new features that nudge user behavior.

After developing prototypes, is required test the ideas to determine which are successful at behavior change.

Behavioral Economic is rooted in testing to validate or disprove each behavioral intervention.

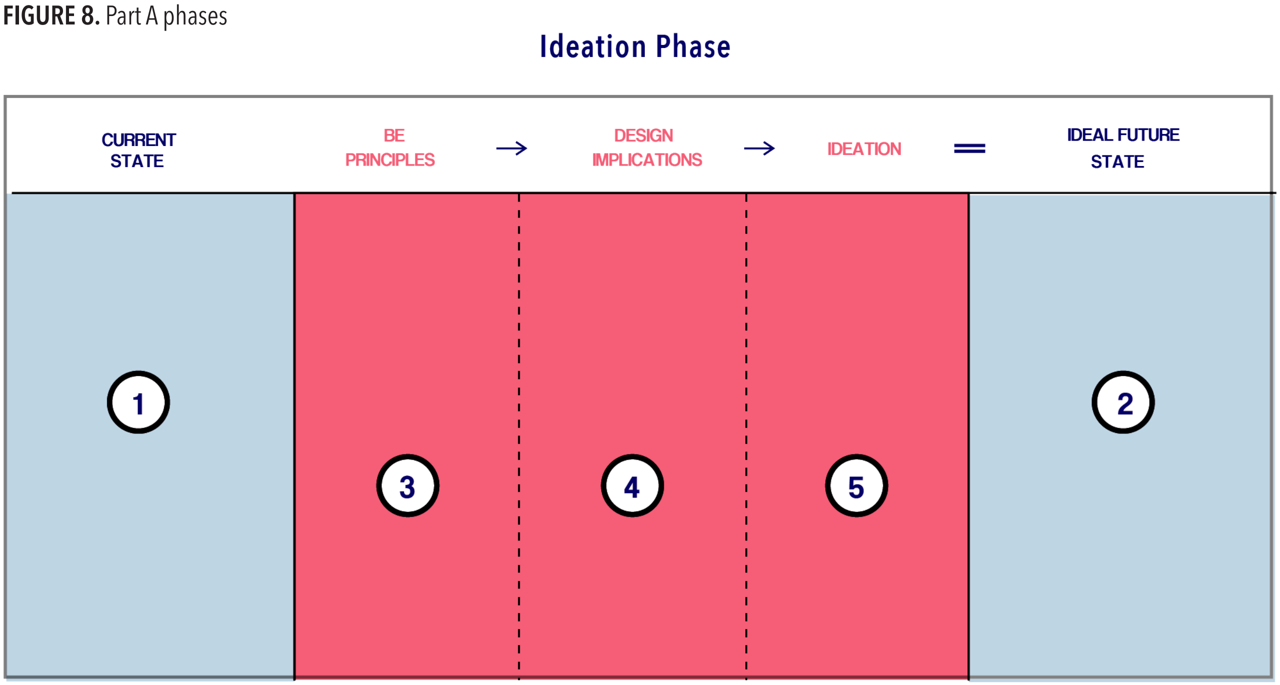
There are two parts of the framework. In Part A, is necessary the BE principles to ideate new features, in Part B, the ideas created by the team should be testing to evaluate which are most successful at creating behavior change.

FIGURE 7. Part A and Part B of the framework



PART A OVERVIEW

FIGURE 8. Part A phases



There are five stages to Part A:
1. First, use all the research insights, experience maps, personas, etc. to understand your user's **Current State** behaviors and outcomes. In this stage review the data will help to look for pivotal moment of decision-making, with those pivotal moment the team will dive deep to understand who owns the key decision, and pinpoint which decisions are causing the current outcomes.
2. Secondly, new behaviors and outcomes that will be planning to achieve through the design intervention in an **Ideal Future State** must be define.
This framework is an extension of the design process, and thus needs to fit within the project's core objectives and criteria; also, it's an antithesis of the current state

At the highest level moving from Current to Future State could be: 'not saving money' to 'saves money', or 'doesn't take transit' to 'takes transit'.

3 - 5. Next, you'll bridge between the Current and Future States by identifying **BE Principles** involve, defining Design Implications to guide your thinking, then doing **Ideation** to come up with ideas that pull it all together to accomplish the Future State.

PART A: TWO APPROACHES TO USING BE

Within with middle portion of the framework, there are two approaches to using BE:

In the top part is the section of "Understanding & Optimizing"

This approach will serve to:

• Understand user's current behavior through a BE lens (regardless of whatever service they're using)

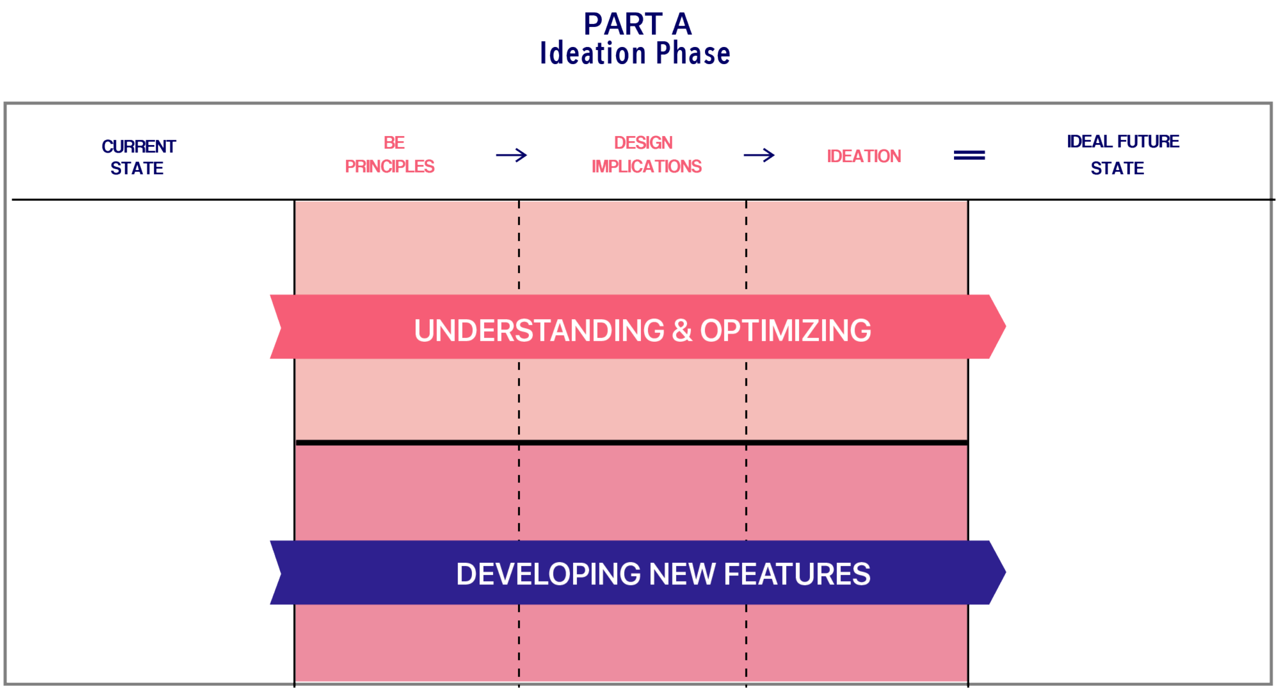
• Evaluate and optimize user's behavior in relation to the existing product or service

In the low part is the section of "Developing New Features"

This approach will help to:

• Develop net new products, services, or features that leverage insights from BE principles and could inspire new designs that would nudge users towards the Ideal Future State.

FIGURE 9. The two approaches of Behavioral Economics



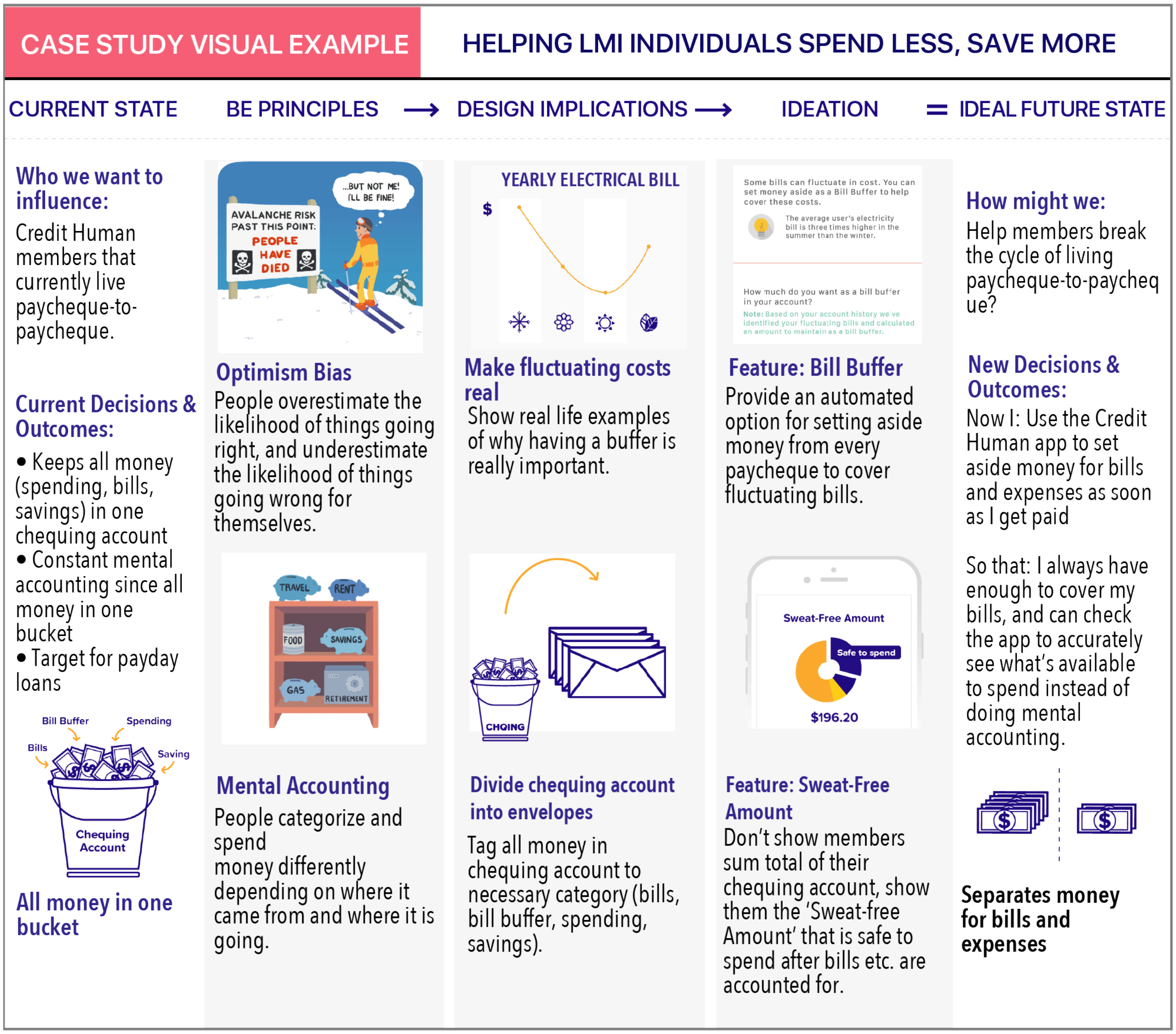
Bridgeable developed a canvas that explains in detail the information that necessary must be fill in each stage of the ideation framework, the figure below is a company's' guide.

FIGURE 10. Part A cheat sheet

CHEAT SHEET		BEHAVIOUR CHANGE FRAMEWORK - PART A IDEATION			
CURRENT STATE		BE PRINCIPLES →	DESIGN IMPLICATIONS →	IDEATION =	IDEAL FUTURE STATE
Define **whose** behaviour you want to change: What **key decisions** do you want to influence: -	UNDERSTANDING & OPTIMIZING	**Identify BE Principles** that might be **causing** the Current State behaviour.	**Develop Design Implications** or rules **to combat or leverage** each BE principle you selected.	**Ideate ways to optimize your product or service's features** based on your Design Implications. The goal is to use your Design Implications to help you come up with new ideas that nudge users towards the Future State.	Anchor your project's strategic intention with a '**How might we**' statement that sums up the primary goal: Define what an Ideal Future State would look like if users **adopted the behaviour changes** you hope to see. What new **outcomes** would result from these behaviour changes
What are the **current outcomes** of the user's decisions:	DEVELOPING NEW FEATURES	**Identify BE Principles** that you think could **help nudge** users towards the Future State.	**Develop Design Implications** or rules to **leverage** each BE principle you selected. The goal is to take each BE principle, extract the insight, and create guidelines for what this might mean in a design context.	**Identify BE Principles** that you think could **help nudge** users towards the Future State.	. A good format is from the end-user's perspective: "**Now I (new behaviour), so that (new outcome)**".

CASE STUDY EXAMPLE

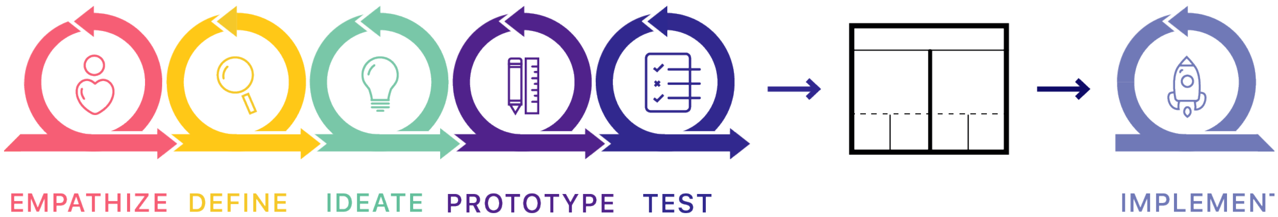
FIGURE 11. Shows an example of a project developed by Bridgeable partnered with Dan Ariely's that helps users to spend less and save more through an app (the images are the card decks developed by Bridgeable with the BE principles).



MOVING FROM IDEATION, TO PROTOTYPING, TO TESTING

As mentioned earlier, the Behavior Change Framework is an extension of the wider design process. The research has already explained in detail how to use "Part A: Ideation Framework", now the document will focus into "Part B: Testing Framework", which uses a BE lens to increase the effectiveness of testing.

FIGURE 12. Shows the process focus in the stage of testing with a general view of Part B



PART B: TESTING AT THE VARIABLE LEVEL OVERVIEW

Testing is a fundamental component to both design and BE, but they often employ different approaches and methodologies. BE Principles enable to make an educated hypothesis about user's behavior, but the designs created must be tested to qualify their effectiveness. Using BE Principles to inform the designs does not guarantee success (Bridgeable, 2018).

In the top part is the section of " Product & Feature-level testing"

• Designers are quite good at testing and validating at the product and feature level of a design.

• Testing products and features answers the questions: "Is the team building the right thing? Does this serve a real need?"

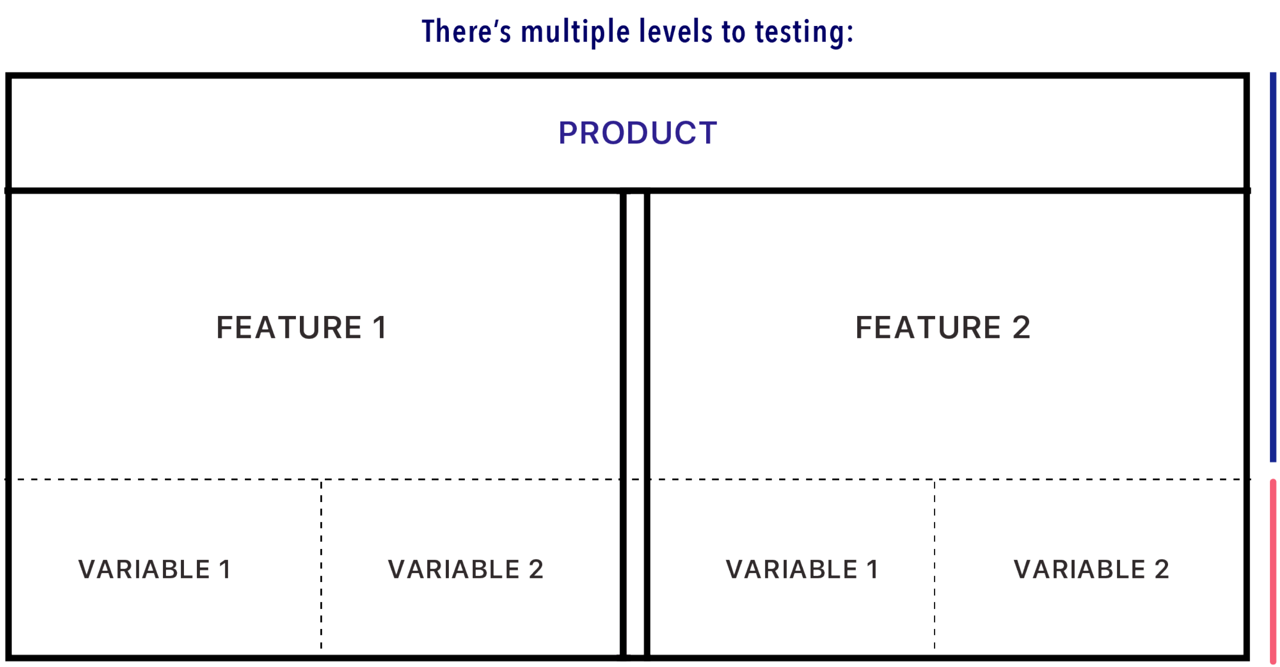
• If is used a BE Principle to inform the product or a feature, you can validate it using traditional design testing methods.

In the low part is the section of " Variable-level testing"

• Behavioral Economists will often operate at the variable level. A variable is a minor variation within a single feature.

• Testing variables is much like A/B testing: take the same design but tweak a small component to optimize for the most effective version.

FIGURE 13. Part B and the levels to testing



TESTING VARIABLES - SUMMARY

As it was explained before through BE Principles, very small details can lead to drastically different outcomes. A behavioral economist would run an entire randomized control trial with hundreds of participants to test a handful of variables within one feature in search of the most impactful levers.

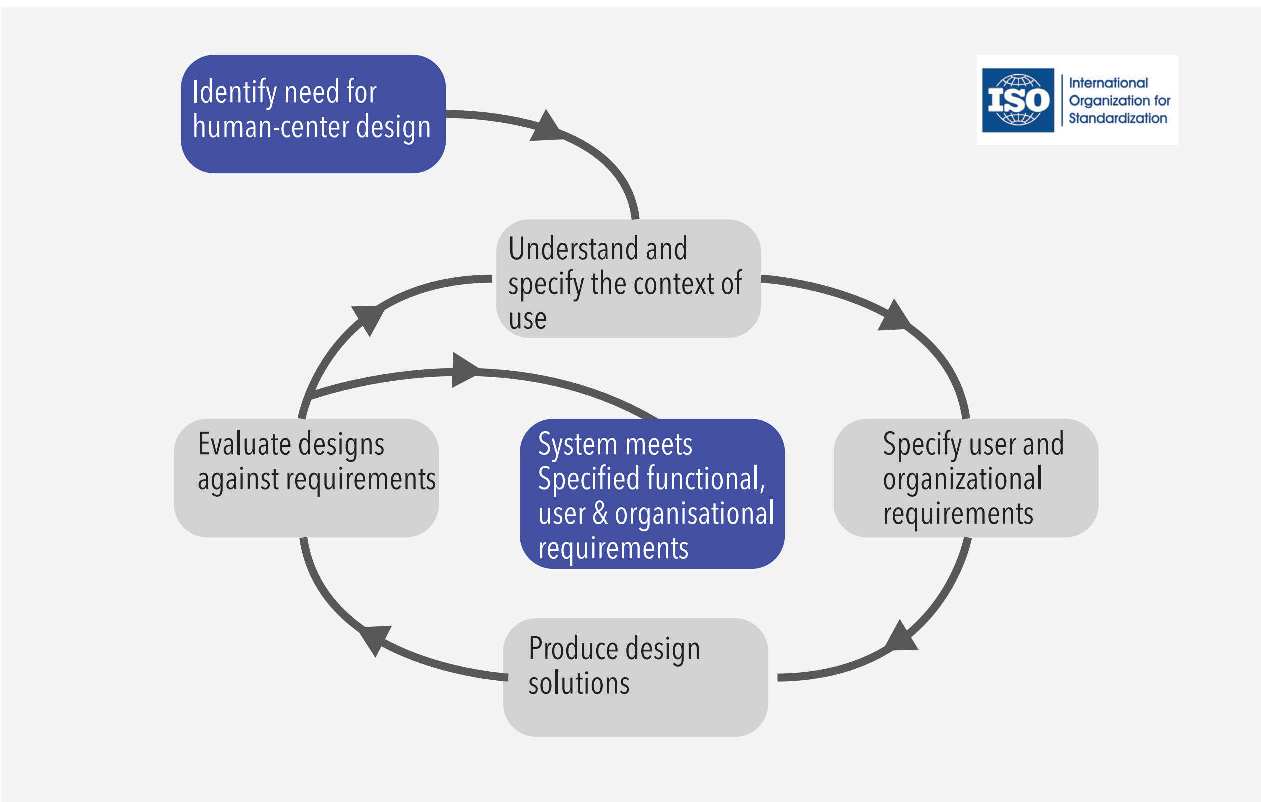
When applying BE in new ideas, you can begin to think about how seemingly small details – like defaults, timeframes, or messaging – can have an enormous impact. If you tap into the right variable, you can profoundly steer the user's behavior towards new outcomes.

3.3 INTERACTION DESIGN PROCESS

The current interaction design process is divided in 6 steps, is a circular method in which any time is required to refine something is possible to go back in a previous step, these are the phases:

- Identify need for human-center design
- Understand and specify the context of use
- Specify user and organizational requirements
- Produce design solutions
- Evaluate designs against requirements

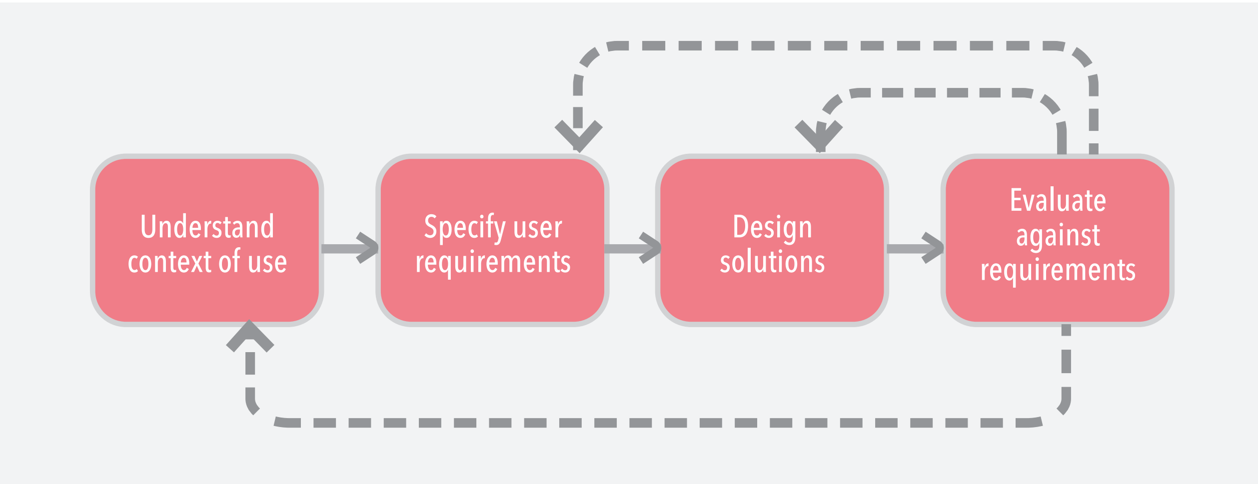
FIGURE 14. The process is summarized in the simple diagram below, based on the standard ISO.



3.3.1 UX DESIGN PROCESS

The UX is a center design, also is an iterative process where you take an understanding of the users and their context as a starting point for all design and development.
A UX designer's typical tasks vary, but often include user research, creating personas, designing wireframes and interactive prototypes as well as testing designs (Interaction Design Foundation, 2018).

FIGURE 15. Shows the UX design process in his four phases.



The next process below explains the result of the analysis of the methods mentioned before. At the Politecnico di Torino is used the method of Interaction design but is important to add the behavioral design process to enhance the results of the services or products.

One of the approaches of this research is used the mix method of interaction and behavioral design proposed as a guide to develop the project that will be exposed in the next chapters.

The method is divided in five phases, the following information explain each step with the actions that should be take into account, the underlined words means the behavior design actions added to the current interaction design process:

Understand and specify the context of use

• Research and understand the scenario
• Select a need for human center design
• <u>Understand how people make decisions (In order to design for behavior, you must first know how habits form, how they can be used, and how feedback plays into each step)</u>
• Select a User group
• Select User profiles
• Based on profiles create the Personas
• Understand how people interact in the environment you want to work.

Specify user and organizational requirements

• <u>Use the behavioral economics principles to translate them in insights for behavioral interventions (use the canvas of behavior change framework)</u>
• Specify the usability-requirements
• Create the concept
• <u>Generate the potential actions each segment of User should do with the new service or product (Look for the Minimum Viable Action that a user can take to reach their goal)</u>

Produce design solutions

• <u>Create a behavioral plan that can be articulated in a customer experience map or a journey map.</u>
• Produce the initial pencil sketches Wireframes (Lo-fi Prototype)
• Use some software to clean up the Wireframes and apply the design style

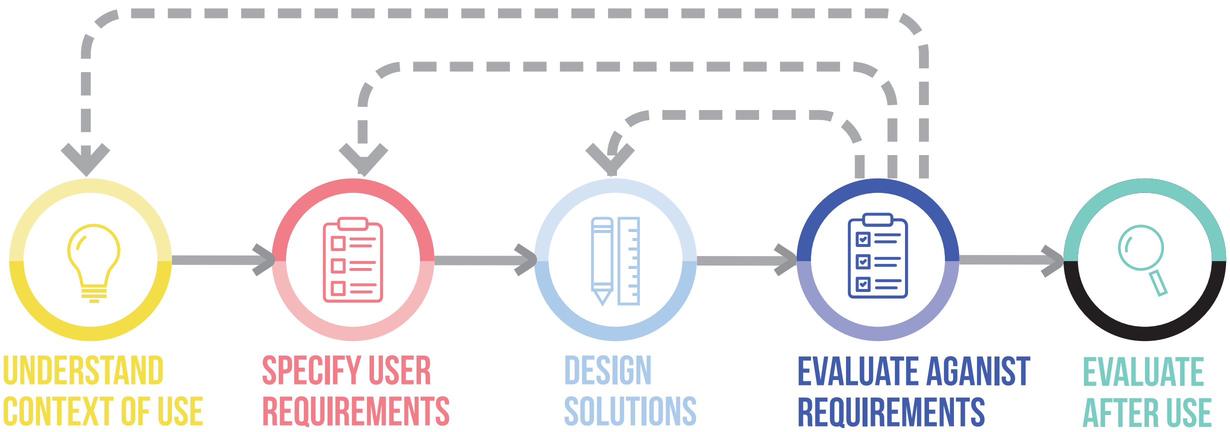
Evaluate designs against requirements

- Take some feedback from your user testing the Wireframes and the prototypes.
- Measure the impact of the product on the outcome and actions (A/B can be a possibility).
- Find obstacles and refine your design

Evaluate after use

- Value the design after it has already been used

FIGURE 15. An abstract of the interaction and behavioral design process



UNDERSTAND CONTEXT OF USE

- Scenario
- Select a need for human center design
- **How people make decisions**
- User group
- User profiles
- Personas
- **Understand how people interact in the environment**

SPECIFY USER REQUIREMENTS

- **Use the behavioral economics principles**
- Specify the usability requirements.
- Create the concept
- **Potential actions of each segment of user should do with the new service or product**

DESIGN SOLUTIONS

- **Behavioral plan articulated in a customer experience map**
- Lo-fi Prototype
- Software Wire-frames and apply the design style

EVALUATE AGANIST REQUIREMENTS

- Feedback from your user testing the wire-frames and the prototypes.
- Measure the impact of the product on the outcome and actions.
- Find obstacles and refine your design

EVALUATE AFTER USE

- Value the design after it has already been used

4. STRATEGIES FOR PERSUASIVE BEHAVIOR IN DESIGN

In this chapter will be explain how to effectively encode experiences that change behaviors, because is necessary a practical understanding of human psychology, specifically the insights into the factors that drive human behavior.

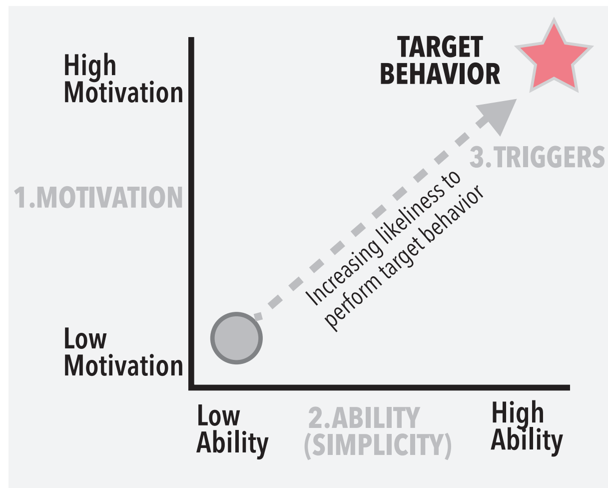
4.1 FOGG BEHAVIOR MODEL

The Fogg Behavioral model's (FBM) asserts that for a person to perform a target behavior, he or she must **(1) be sufficiently motivated, (2) have the ability to perform the behavior, and (3) be triggered to perform the behavior.** These three factors must occur at the same moment, else the behavior will not happen (Fogg B. , 2009).

In order for behavior to occur, people must have non-zero level of both motivation and ability. Increasing motivation is not always the solution, increasing the ability (making the behavior simpler) is the path for increasing behavior performance (Fogg B. , 2009).

Generally, people have at least a modest level of motivation and ability , these levels can be manipulated.

FIGURE 16. Shows the FBM model. The vertical axis is the motivation and the horizontal axis is the ability. The placement of the pink star is symbolic, meant to suggest that high motivation and high ability are typically necessary for a target behavior to occur.



4.1.1 ELEMENTS OF MOTIVATION

The result of this motivator is immediate, because pain is a primitive response, and it functions adaptively in hunger, sex, and other activities related to self-preservation and propagation of our genes.

This dimension is characterized by anticipation of an outcome. Hope is the anticipation of something good happening. Fear is the anticipation of something bad, often the anticipation of loss.

This dimension controls much of the social behavior, from the clothes people wear to the language they use. Folks are motivated to do things that win them social acceptance.

4.1.2 ELEMENTS OF SIMPLICITY (ABILITY)

It's not a secret that people are generally resistant to teaching and training because it requires effort. Instead, to increase a user's ability, designers of persuasive experiences must make the behavior easier to do, the power behind is in the simplicity.

Foggs in his paper define simplicity in six elements that work together, for him these are related to each other like links in a chain: If any single link breaks, then the chain fails. These are the six parts:

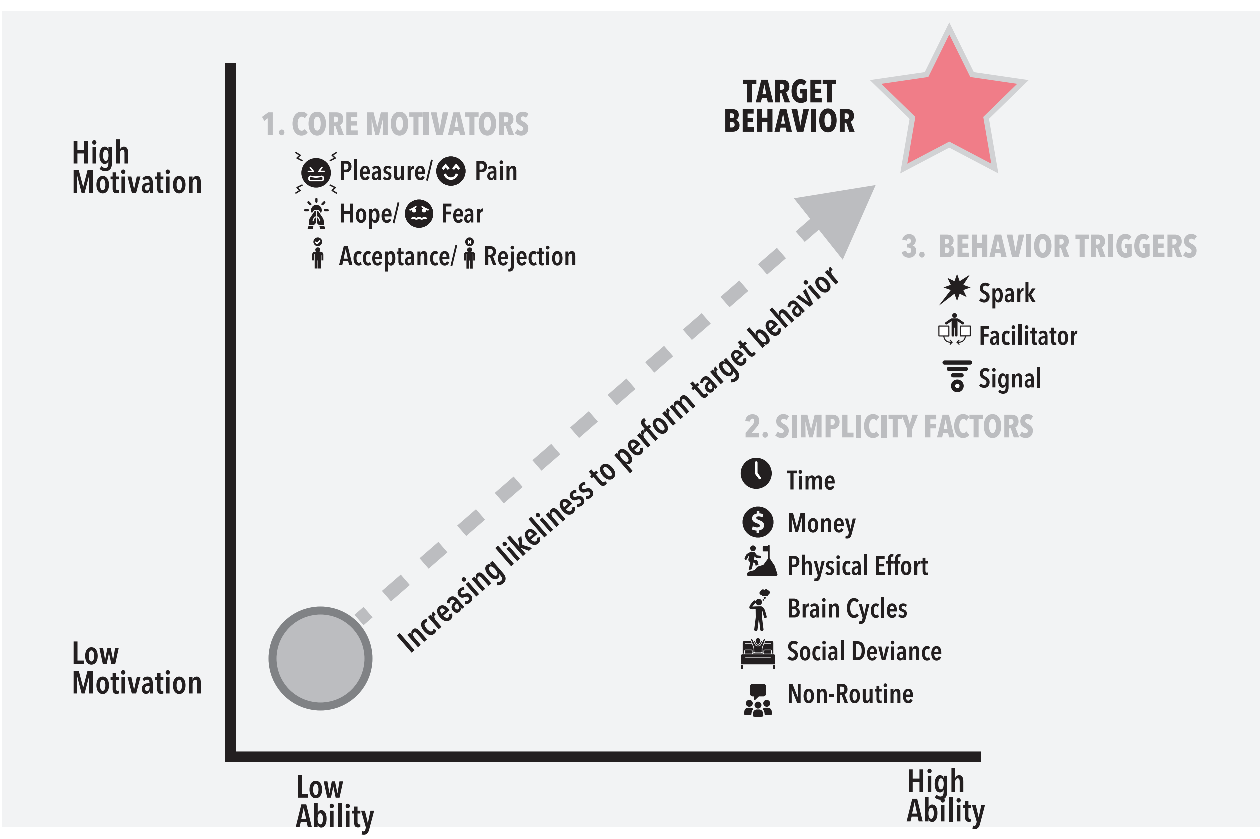
Time	If a target behavior requires time and your product or service available is complex, then the behavior is not simple.
Money	For people with limited financial resources, a target behavior that costs money is not simple. That link in the simplicity chain will break easily. For wealthy people it's different, because this target will simplify their lives by using money to save time.
Physical effort:	If the behavior required a physical effort the people won't take into account.
Brain cycles	If performing a target behavior causes your users to think hard, that might not be simple.
Social Deviance	If a target behavior requires to be socially deviant, then that behavior is no longer simple. For example, wearing pajamas in a public space, it will cost a social price and some complications.
Non-routine	People tend to find behaviors simple if they are routine, activities they do over and over again.

4.1.3 TRIGGERS

A trigger is something that tells people to perform a behavior now and can be classified in three types:

Spark as trigger	When a person lacks motivation to perform a target behavior, a trigger should be designed in tandem with a motivational element.
Facilitator as trigger	The goal of a facilitator is to trigger the behavior while also making the behavior easier to do. An effective facilitator tells users that the target behavior is easy to do, that it won't require a resource he or she does not have at that moment.
Signal as trigger	If the behavior required a physical effort the people won't take into account.

FIGURE 17. A summarize of all three factors mentioned by Fogg in his model with their subcomponents respectively.



4.2 EMOTIONS

Firstly, is important recognize that emotions change the decisions we make by making us more impulsive (Ariely, 2010). Through rewards can be possible to motivate people achieve their goals and drive their emotions for the right decision.
Generally, emotions tell two things:
That you should keep doing something (pleasure)
That you should stop doing something (pain)"

There are three fundamental emotional states that people can be in:

Unemotional, rational state
When a person feel calm and rational is in the Unemotional states. In this state the person is most able to think clearly and critically about the situation or decision at hand.

Yes! Emotional state
This state cause in the crowd do things that will further heighten that state. Some examples of this state are:

- Sexual attraction
- Happiness
- Desire

No! Emotional state
This state is related to be in painful. No emotional state causes to do all sorts of things that will get rid of the emotional state. Some examples of this state include:

- Fear
- Sadness
- Disgust
- Hatred
- Hunger

4.3 INCENTIVES

Most successful products have a compelling incentive system in place. It's the motor that keeps each product buzzing with user activity.

Money	It allows to eliminate various pains in live and indulge in many different pleasures. While money is effective, it should be used in moderation. If you want someone to perform a one-time behavior (such as signing up for your service), money can be an ideal incentive.
Things	This reward refers to tangible prizes like food, electronics and others. Tangible rewards are stimulating. They're not abstract. Their value is easily understood, felt and have the added benefit of deepening a social relationship.
Social	Things like praise, social recognition, status, and so on are examples of social rewards. We are social creatures, so the attention and respect of others can be a powerful motivator. Social rewards are cheap: They cost nothing and can be given frequently and lavishly.

Points	Are representations of achievements, progress indicators, and relative standing to other people. Points tell users what the ideal behaviors are by giving them feedback every time they perform a desired behavior.

The frequency on rewards is another important factor because when you're first getting users to perform a certain behavior, the rewards should be given each time the behavior occurs, so that users make a clear connection between the behavior and the reward. Over time, however, variable/surprising rewards work best. In conclusion ditch the delay.

5. WELLNESS

Wellness is a holistic integration of physical, mental, and spiritual well-being, fueling the body, engaging the mind, and nurturing the spirit (Terps, 2017). Wellness is really important because every emotion you feel and everything you do is related to your well-being.

Wellness is categorized in eight dimensions, each one is interrelated with another and their importance is equally because their aims seek for optimum health (Stoewen, 2017). These are the dimensions: physical, intellectual, emotional, social, spiritual, vocational, financial, and environmental.

5.1 WEARABLE DEVICES IN WELLNESS

In the last years, wearable devices have been taking an important role in the wellness sector because through them can be possible to collect personal data; however with the interaction modality with the data, the user is often not able to understand, manage and interact with the complexity (e.g. physiological data). The data can be just read, preventing the higher level of interaction that would allow the user to reflect and decide to act differently for the future (Montagner, et al., 2017).

Montagner also in his research mentioned the application of the **systemic approach to digital products or services means to consider inputs and outputs as part of a complex communication system in which every exchanged data can be communicative and therefore interactive in order to immediately become keystones of other nodes.**

Nowadays, the data collected is treated as separate component, instead of be used as a keystone to create new relations with the environment, the social, the habits and the small daily actions to impact in a good way the well-being behavior in the persons.

For a better understanding is important clarify the wearable technology in the period between 2013 and 2015 because has radically changed in percentage spread. The wearable devices have been applied in different areas such as sports & fitness where has increased their usage from 28.6 to 40.8%, in the lifestyle & fashion areas from 23.7 to 37.9%; in the security & prevention sector from 3.6 to 5.7%. In the gaming category has fallen to 7.8% from the starting 28.1%; Finally, in the Healthcare and Wellness sectors, instead, spread down from 16 to 7.8%.

As I mentioned before in the last paragraph the sector of the Healthcare and Wellness has the opportunity to create new technological solutions even if it has decrease in the past years due to the fact of lack of interaction with output data collected that wasn't valuated.

5.2 MOBILE CROWDSENSING SERVES (MCS)

Mobile crowdsensing serves as a critical building block for emerging Internet of Things (IoT) applications. The IoT applications can be divided in four categories (Atzori, Iera, & Morabito, 2010): the transportation and logistics domain, the healthcare domain, the smart environment (e.g., home, plant) domain, and the personal and social domain.

In the Healthcare domain MCS can utilize existing data for large- scale healthcare studies. Based on the wealth of data collected from MCS systems, health monitoring and management services can be roughly categorized as public health monitoring and personal well-being management (Guo, et al., 2015).

In the personal well-being management, MCS can facilitate personal well-being management by monitoring users' daily activities.

In a data collection of MCS a research made by (Lane, et al., 2013) explained some strategies and their efficiency. One of these is the data manually collected by a user controlling the sensing device, such as a smart- phone with a specific application, this approach is attention-consuming and inefficient. On the other hand, Context-aware data sensing is triggered by predefined contexts, such as a particular location or time slot, this method releases the user from focusing on the crowdsensing tasks and makes it practical.

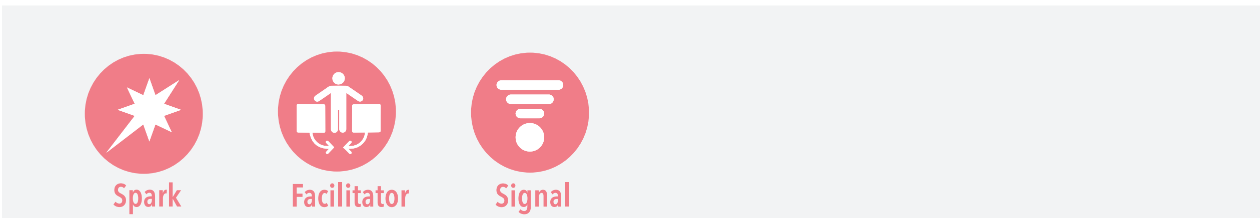
Nowadays the MCS projects have some issues to motivate and incentive their users to participate in a crowdsensing application, the success of an app depends on the contribution of volunteers. For that reason, one aim of this thesis is understanding and developing the right system to motivate with rewards the users to change an existing behavior and recollect data for future interventions through the MSC.

6. CASE STUDIES FOR CHANGING BEHAVIOR

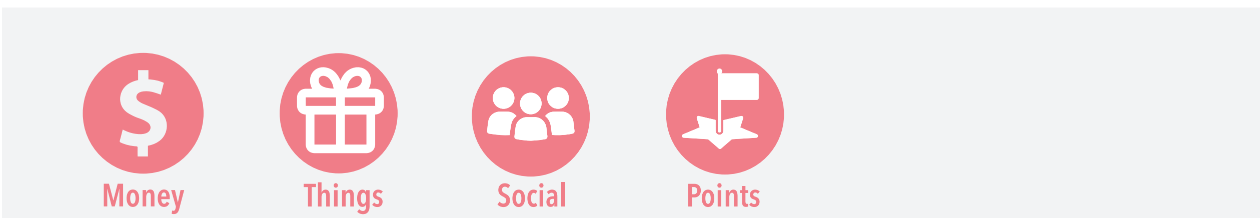
The selection of the case studies were products and projects that have been done before and their aim is focus on behavioral change, also the apps chosed have good rates by its users.
The next list of cases is categorized in four different applications domains: Transportation & logistics, Smart environment, Social and Personal domain and Healthcare.

Each case study is analyzed by different factors: motivators, rewards and triggers.
The next list of icons is a guide of the different factors that were used to understand each product or service selected.

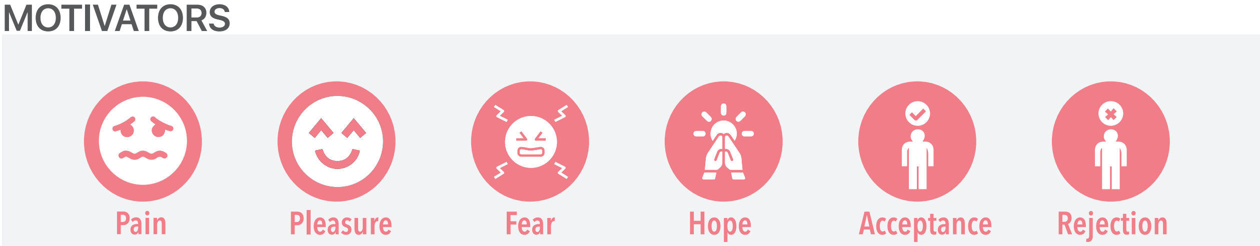
TRIGGERS



REWARDS



MOTIVATORS



6.1 TRANSPORTATION & LOGISTICS

AMAZON

Year: 2010
Designed by: Jeff Bezos

Description
Amazon is the **world's largest online e-commerce retailer** and a prominent cloud services provider. Not only has it expanded its offerings of goods and services, but it also participates in the streaming video marketplace, the cloud computing marketplace, and most recently Amazon has entered into banking.

Analysis
The secret of Amazon is regarding its **simplicity through the one-click shopping**. Simplicity changes behaviors and in this case when buy is easy, people will buy more.
Amazon also has the **pleasure motivator** of get the right thing the customer is seeking, because has **rating points of stars** of each products and **social reviews** that has been written by other buyers.

RIDE 2 REBEL

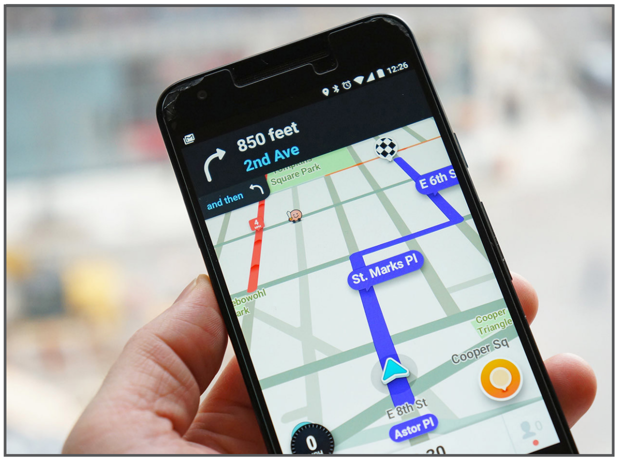
Year:2016
Designed by: James Balfour and Giles Dean

Description
Ride to rebel is the concept of a ride studio on wheels. An English fitness company is set to offer people the opportunity to **exercise while traveling on a bus**, that will **allow riders to use stationary bikes** while they will be on the bus. This idea was born for those who want to ride to and from work and for those who don't want to because of the hazards associated with cars, pedestrians, beat up roads, and the changing weather conditions.

Analysis
The company use the **facilitator trigger** to make the behavior of exercise easier and put aside the **motivators of pain** and become them into an opportunity to be healthier when you want to transport with security and in an ingenious way.

6.1 TRANSPORTATION & LOGISTICS

WAZE

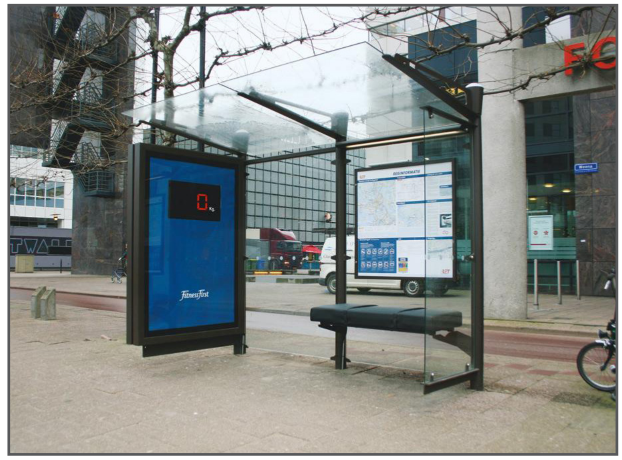


Year:2008
Designed by: Ehud Shabtai, Amir Shinar and Uri Levine

Description
Waze is a **community-driven GPS** and navigational app owned by Google, that **guides its users through the shortest route** possible while driving. It runs on a smartphone and can help find directions and avoid traffic jams.

Analysis
The success of Waze is in its **social community**, because constantly its users are giving **information to share regarding the traffic, police, accidents** and others. The data recollected is also used for city planners, transportation departments and first responders. The app has **pleasure motivators** and **signal triggers**.

FITNESS FIRST: BUS STOP



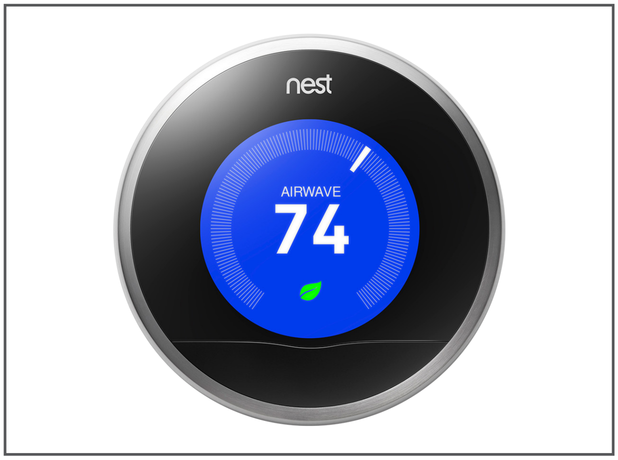
Year: 2019
Designed by: Fitness first

Description
In a bus stop the **passenger are confronted with their weight by a bench** that showed it in the digital ad of the bus stop, it makes **reconsidered the decision of use the bus or take a walk**.

Analysis
Fitness first was looking to motivate people to exercise more, they did it in a **"cruel" but effective way considering the pain of people** when they see their weight and the company used the **signal trigger** to encourage the passengers to walk instead of taking the public transportation.

6.2 SMART ENVIRONMENT

NEST

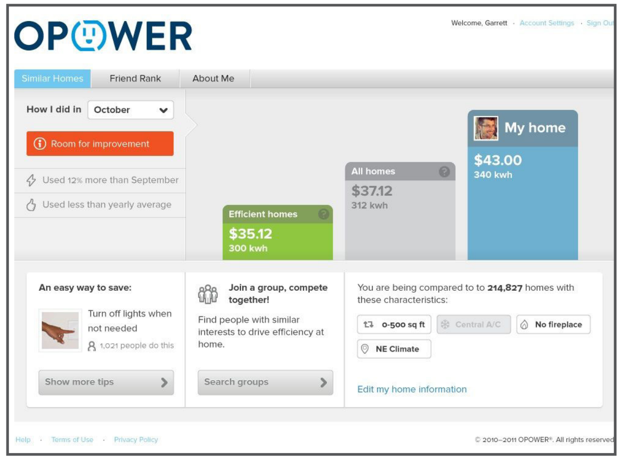


Year: 3rd generation in 2015
Designed by: Fred Bould

Description
Nest is a **thermostat that learns your home heating schedule, reinforces good energy usage** with a simple phone app, and automates saving money on electricity bills.

Analysis
The goal of this company is help individuals decrease individual energy usage, thus its design is a **facilitator trigger**, it makes easier the good usage of the energy and is helping the environment at the same time. This device has a **pleasure motivator** and a good **reward** simultaneously because **people feel happy saving money** and don't required an extra effort.

OPOWER



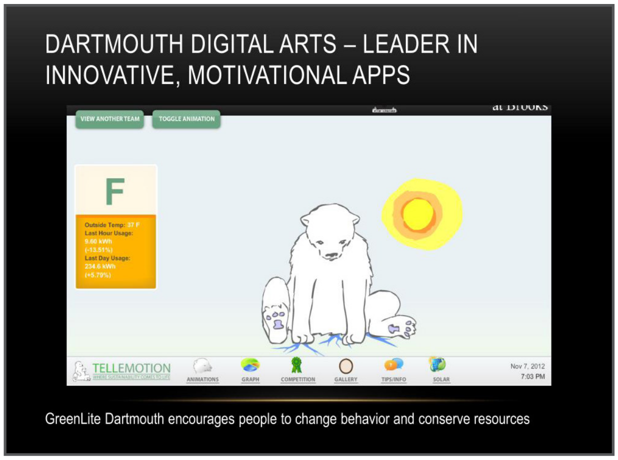
Year: 2007
Designed by: Dan Yates and Alex Laskey.

Description
Is a software company, best known for d**elivering monthly reports to utility customers**, showing them how their energy usage stacks up against their (anonymous) neighbors. It's a well-studied and applied technique in social psychology called **peer comparisons** to encourage people to **use less energy**.

Analysis
Opower combines a cloud-based platform, big data, and **behavioral science** to help utilities around the world **reduce energy consumption**. The software has a **spark trigger** and an **acceptance motivator**, because been on the green consumption become a challenge, this helps consumers **lower their energy use and costs as a reward**, and significantly **reduces carbon emissions.**

6.2 SMART ENVIRONMENT

GREENLITE DARTHMOUTH



Year: 2009
Designed by: Darthmouth

Description
GreenLite Dartmouth focuses on changing behavior by making **energy conservation a priority for students** by creating both an i**ntellectual and emotional connection** between **daily actions and their adverse effects on the environment**, where each action made by a student is reflected on an animation of polar beers on a display.

Analysis
They combine computer graphics, art, engineering, sociology, environmental science, systems-thinking and behavioral psychology to turn real-time energy use data into a facilitator trigger through a meaningful interactive display. Darthmouth use the **pain motivator** of the state of a polar bear into a feedback of how users can improve their energy usage and as reward there were a **social status competition of energy saving** in the dorms of the campus.

MAGWARE - MAGNETIC FLATWARE

Year: 2019
Designed by: Windsor team

Description
Bring your own **(BYO) Cutlery daily** instead of use disposable utensils could **reduce the number of plastics that get thrown away every year**. Magware utensils are a simple light-weight solution to help in this mission, by making them as organized and easy to carry as possible.

Analysis
This object has a **facilitator trigger**, because it doesn't change the routine of use cutlery, it just change in a simply way a current **behavior** for an **eco-friendly** one, using Hypalon for the pouches a resistance material and high strength Velcro for the closing mechanism, to make it easy to transport. It has an a**cceptance motivator** because with little actions, the people can have a **good environment impact**.

6.2 SMART ENVIRONMENT

YESBRELLA

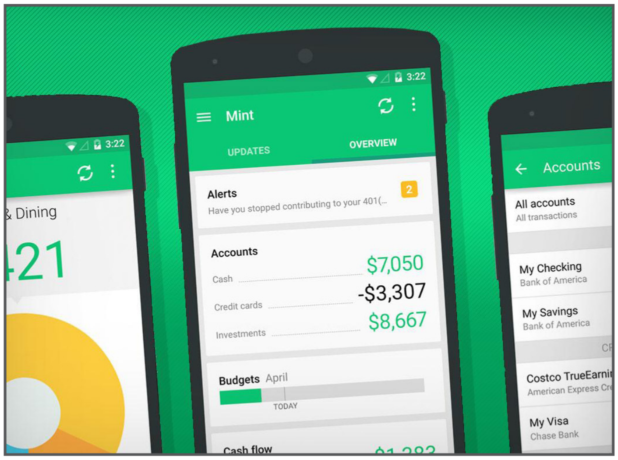
Year: 2019
Designed by: Sheng-Chun Lee

Description
Umbrellas are an essential part of everyday life, but the average umbrellas on the market can no longer meet the customer expectations, which is exactly the core of YESbrella, **avoid the unpleasant situations on rainy days**, like trying to get into your car, but can't manage to close the long umbrella without getting stuck in the car door or carrying a dripping umbrella that gets water all over your clothes.

Analysis
The designer of the object though in all the actions the person has to do with an umbrella in a rainy day to **avoid pain** and **rejection** of been wet that is a feature of the usual umbrellas. The utensil is **simple** because doesn't change the routine and **doesn't require a physical effort to** use and it's also a **facilitator trigger**.

6.3 SOCIAL AND PERSONAL DOMAIN

MINT FINANCIAL APP

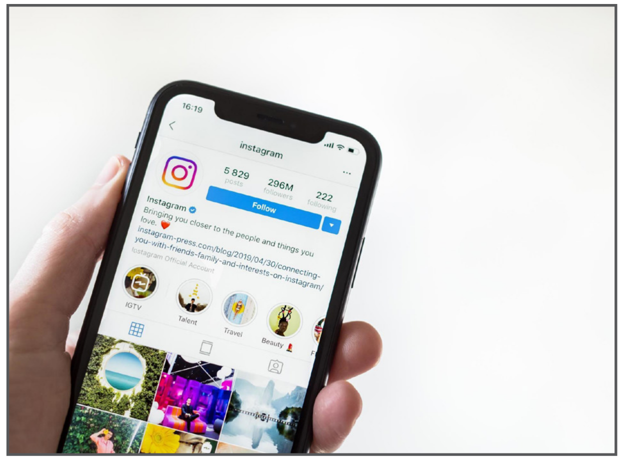


Year: 2009
Designed by: Aaron Patzer

Description
Is a **personal financial management and budgeting app**, allows their customer to track their investments and save for retirement. Mint also offers alerts for bill due dates, rate changes and large purchases.

Analysis
The app's goal is to analyze the spending habits of their users, categorize them and make suggestions. The app used the **facilitator** and **signal trigger** to help their users to spend correctly their money, as a **reward** the people **save more towards their goals**, pay their bills on time and indirectly have a **pleasure motivator**.

INSTAGRAM



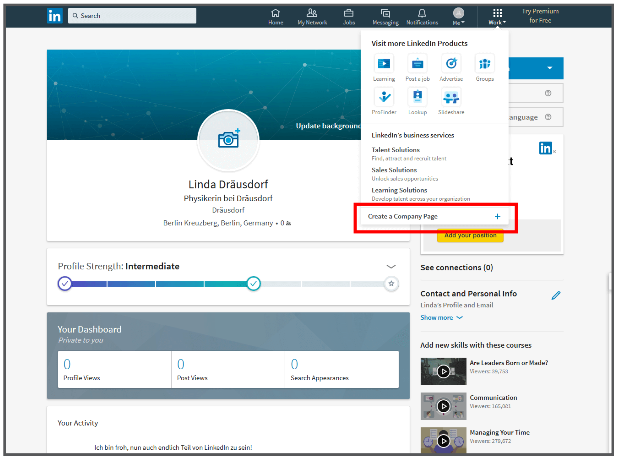
Year: 2010
Designed by: Kevin Systrom

Description
Instagram is a **free photo and video sharing app**. People can upload photos or videos to the service and share them with their followers or with a select group of friends.

Analysis
Instagram's goal is the interaction of people through a **social network**, the power of this app is regarding its visual content and the **reward behind of social recognition**. All the social human creatures require attention and respect of others, the comments, likes and compliments are a powerful **pleasure motivator**. Instagram also has **signal triggers** to keep in touch their users with the content.

6.3 SOCIAL AND PERSONAL DOMAIN

LINKEDIN



Year: 2008
Designed by: Reid Hoffman

Description
LinkedIn is a social network that focuses on **professional networking and career development**.

Analysis
The aim of the company is connecting professionals from around the world to help them become more productive and achieve all their work goals. This network was created with a **spark trigger** because it's constantly motivating their users when is recommending interest open jobs offers, additionally has two types of **rewards**, the first is the **point** one when the page is giving to its user's **instantaneous feedback of their performance** and the other is the **social recognition**.

KICKSTARTER

KICK
STARTER
.COM

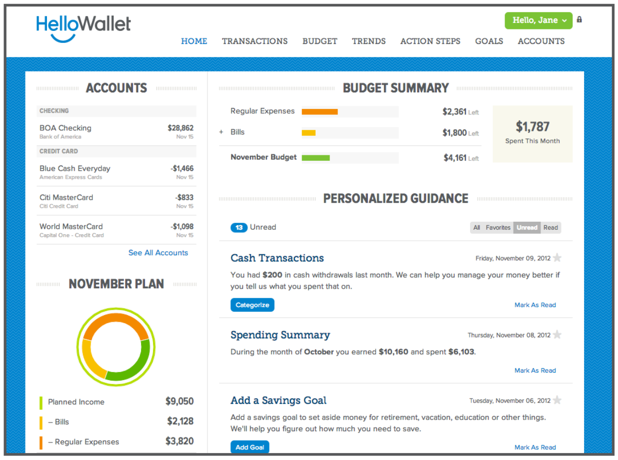
Year: 2009
Designed by: Perry Chen

Description
Kickstarter is a **funding platform for creative projects**. Everything from films, games, and music to art, design, and technology. Kickstarter is full of ambitious, innovative, and imaginative ideas that are brought to life through the direct support of others.

Analysis
Kickstarter is a platform that let manufactures **raise money and turns customers into a community**, it means, that the **money** and **the social intervention are two rewards**.
As a spark trigger, they update their users with progress reports and respond to suggestions in comments and discussion forums during the product's genesis to hopefully motivate the creator to build the right thing.

6.3 SOCIAL AND PERSONAL DOMAIN

HELLOWALLET

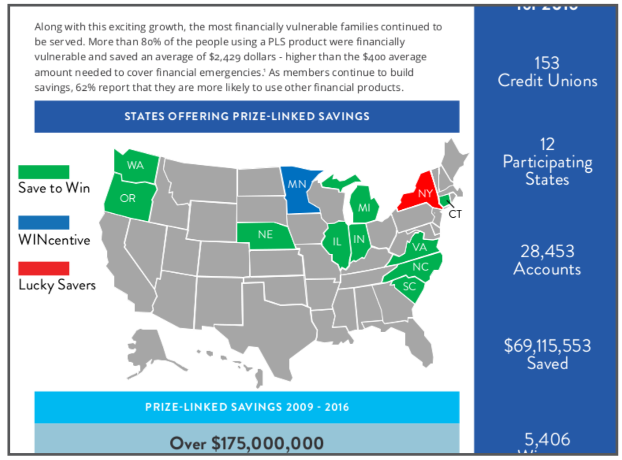


Year: 2009
Designed by: Matt Fellowes

Description
HelloWallet is a web and mobile application for employees. It provides **personalized financial guidance** to members and **relies on behavioral economics** to incentivize workers to implement its advice.

Analysis
At HelloWallet, his primary goal is to help people save money for the future, it means, the company oriented his users in personalized financial decisions to create a budget, such as **reward** the people is **saving money** for retirement and get alerts to improve some changes in their account through the **signal triggers**.

PRIZE LINKED SAVINGS



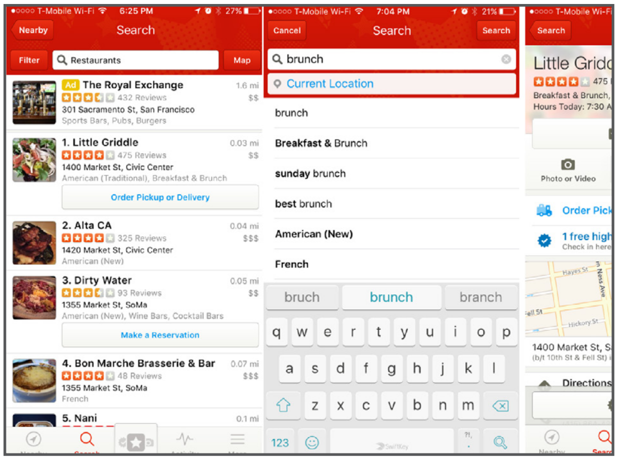
Year: 2009
Designed by: Commonwealth's innovation group

Description
Prize-Linked Savings (PLS) is an application of the use of **prizes to address the financial challenges of savings**. It **transforms savings into a fun, exciting experience** by giving savers the chance to win prizes by depositing into their PLS account.

Analysis
Prize-linked savings makes **contributing money to a savings account incidental** because some users have a strong preference for gambling in lotteries, instead, with the **facilitator trigger** the person can buy and play a lottery with multiple tickets and as a **reward** has the **possibility of win money** or **things** and sequentially it becomes in a **pleasure motivator**.

6.3 SOCIAL AND PERSONAL DOMAIN

YELP ELITE



Year: 2007

Designed by: Russel Simmons and Jeremy Stoppelman.

Description

Yelp is a crowd-sourced website and mobile app Headquartered in San Fransisco, USA; however, it can be found in other countries. **Yelp provides reviews, guides, and tips for any activity people have in mind**. Yelp is a **community** where you have to pay to be a member but have a huge possibility of activities to do if you want to meet new friends.

Analysis

Yelp has encouraged its users to consistently post reviews and add new businesses by enticing them with **"Yelp Elite" status**. This badge of **social status** has driven substantial site usage. It's important to add that Yelp Elite users also receive **tangible rewards and perks** such as invites to special parties and exclusive offers from businesses, thanks to that Yelp has **spark triggers** to motivate its users to continue being part of the community.

FOURSQUARE

Year: 2009

Designed by: Dennis Crowley and Naveen Selvadurai.

Description

Foursquare is a **social networking service** available for common smartphones. The app's purpose is to help folks to **discover and share information about businesses and attractions around them**. Every time they use it, they share information about the community to their friends.

Analysis

Foursquare is built upon **social rewards**. Users receive **status points** for checking into venues frequently, also they have some perks by the place if they become in a "mayor" (most frequent visitor). The app has **spark triggers** to motivate the community to go in the right spot close to them.

6.4 HEALTHCARE

SLEEPWELL

Year: 2019
Designed by: Anthony Dickens

Description
The needs of sleep and drink water are important for the wellbeing. However, until now, **bedside hydration** has been problematic because there are huge accidents to knock over the glass.

Analysis
The intention of the company is to **restore the bedside harmony.** The team created a glass that's nicer to touch, harder to accidentally knock over and quiet to put down, it means, that **erase the fear motivator** of drinking at night, use a **facilitator trigger and has simplicity factor** in its design to make really easy the behavior of drinking when you are oversleeping.

ULLA HYDRATATION REMINDER

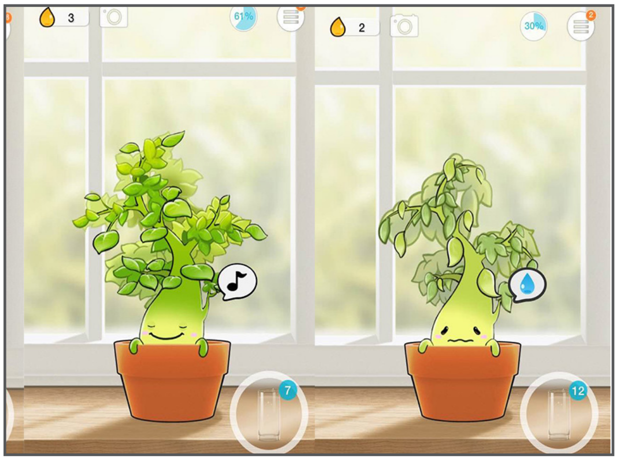
Year: 2016
Designed by: Ulla Labs

Description
Seventy percent of people don't drink enough water because they are busy or forget to do it. Ulla is a **personal hydration coach** that attaches to the side of any water bottle and flashes every hour or so, to **remind you to drink.**

Analysis
Ulla use the **light blinks as a pleasure motivator and a signal trigger** to remember the habit of drink water during the day. The design is **simple** because it can be adjustable to any kind of bottle, so it doesn't a physical effort. The **reward** is get the **optimal hydration your body needs.**

6.4 HEALTHCARE

PLANT NANNY APP



Year: 2013
Designed by: Fourdesire team

Description
Plant Nanny is fun, little app that **combines the process of growing plants with the healthy habit of drinking water.** The app lets you pick a cartoon seedling and as you drink water throughout the day, you add those glasses to the app and water your plant.

Analysis
The app uses a **spark and signal trigger**, in this case is the plant that works as a motivator element and helps to remember when to drink water. As a **reward**, plant nanny offers **virtual things like seeds** that can be used to buy more exotic plants or can revive the ones that have been dead.

GLOWCAP

Year: 2009
Designed by: David Rose

Description
A **cap for prescription bottles that use light and sound to signal when it's time to take medications**, the product also records when a pill bottle is opened and then wirelessly relays this information into an online adherence report. Furthermore, automatically reorders the medication online when the consumer needs it.

Analysis
The aim of the Glowcap is understand the different activities require from the user in their busy daily life to **avoid the pain of forget to take the pills**, for that reason the cap has an **illuminate and melody signal trigger** to remember the right time. Moreover, is a **facilitator trigger** because when there aren't enough pills the Glowcap service mail can order it in the pharmacy as soon as possible.

6.4 HEALTHCARE

CLOCKY

Year: 2006
Designed by: Gauri Nanda

Description
An **alarm clock that jumps off the nightstand** and rolls around the room, so the user can't turn it off without getting out of bed.

Analysis
The designer analysis the problem of people who are over-sleeper who are routinely late for morning activities. The aim of the product is to wake up the user and the company accomplished it **eliminating the fear of stay asleep**, using the **spark and the signal trigger**, because unconsciously the person is motivating to get out of his bed to turn off the alarm. In this case the **reward is the hope of been on time.**

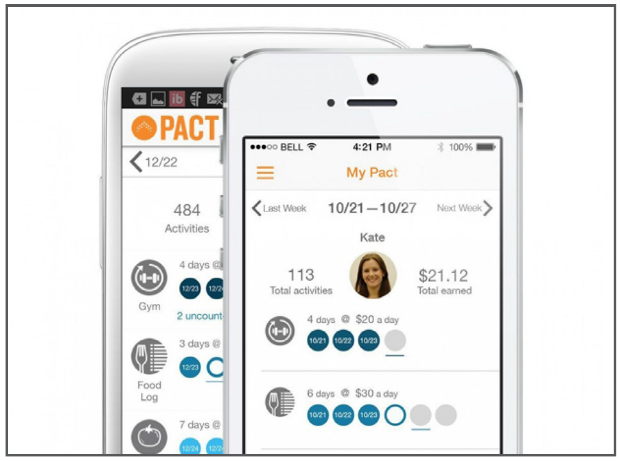
6.4.1 HEALTHCARE (EXERCISE)

FITBIT CHARGE 3

Year: 2018
Designed by: Fitbit crew
Description
Is a **fitness activity tracker** that helps people to measure their **heart rate, calorie burn and their blood oxygen**, it can also monitor the sleeps patterns and has a goal based on exercises. Additionally, has smartphone notifications and at least 7 days of battery.

Analysis
The fitbit's aim is to understand the activity of their users and **boost their workouts**, through their system as a guidance for their users. Its design has **signal trigger**, it works as reminder to move, as well is a **pleasure motivator** because if their users learn about themselves and their workouts, they can start making awareness changes that matter. Finally, as a **reward**, the person will feel better physically and can **share in the social media their achievements.**

PACT



Year:2012
Designed by: Yifan Zhang and Geoff Oberhofer

Description
Pact is an app that aims to get you exercising on a more regular basis by **paying you when you work out and penalizing you when you don't.**

Analysis
The creators of the app used **fear of loss motivator** to get people to go to the gym, they took the concept of **"the endowment effect" from the Behavioral Economics** and applied it to **fitness**. As a **reward** their consumers receive **money** if they go to the gym, and if they didn't, Pact remove a percentage of their money in their cards.

6.4.1 HEALTHCARE (EXERCISE)

VIRZOOM

Year: 2016
Designed by: Eric Janszen and Eric Malafeew

Description
VirZoom is a **fitness oriented virtual reality Input Device powered by pedaling**. This stationary bicycle is fitted with wireless sensors that measure speed, and action buttons for more advanced game control.

Analysis
The main purpose is to make **home exercise more appealing and fun** through **gamification**, use of virtual reality and a regular stationary bike. The **rewards** of the game are the **points and the velocity of a particular environment** that could be faster depending on the pedaling speed of the users. It also has **facilitator trigger** because when the user is focus on the game, he forgets that he is exercising.

6.4.2 HEALTHCARE (EAT WELL)

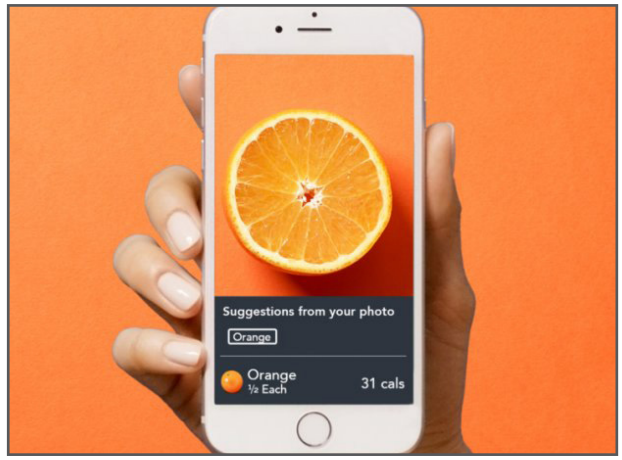
HABIT, FOOD PERSONALIZED

Year: 2017
Designed by: Neil Grimmer

Description
Habit is a **kit that test your blood, your calories and understand your biology to offer the appropriate eating plan** for its users, helping them to achieve their goals like weight loss, increased energy, and improved overall health. Also, the company offer to deliver customized meals to users' doorsteps.

Analysis
The aim company's is giving nutritional recommendations based on individual's biology. Its service has **pleasure motivators** because with **personalized data their users receive personalized meals** and the kit is a **facilitator trigger** to make easier health habits.

LOSE IT!



Year: 2015
Designed by: Charles Teague
Description
Lose It! Is a user-friendly **weight loss app** focused on **calorie counting and weight tracking**. Thanks to the analysis of weight, age and health goals, Lose it, generates **personalized weight loss plan**. As a plus the app has a "Snap It" feature, which allows you to track the food intake and portion sizes simply by taking pictures of your meals.

Analysis
The app's aim is to help users count calories and track their weight in an easy way. Lose it, uses **facilitator trigger** through the picture option, this feature **avoid the pain** of add each food intake and use simplicity factors like saving time and don't required **physical effort**.

6.4.2 HEALTHCARE (EAT WELL)

MEALIQ

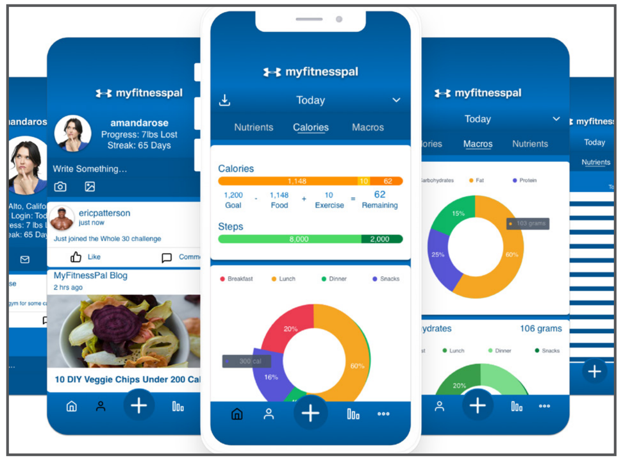
mealIQ

Year: 2016
Designed by: Mealiq team

Description
The app helps you to **customize the perfect meals that fits for you** in items like your budget, food intolerances, diet, macro nutrients and taste preferences. The user can select the recipes offered by the system and automatically is generated a shopping list, if the person wants can add it in a Tedesco shopping basket and check out it at your convenience.

Analysis
The company goal is to help people eat well thanks to plan ahead a customized health meal. The app use **facilitator trigger** because all the activities like shopping and select what to eat seems **simple**, for that reason is also related to have **pleasure motivators**.

MYFITNESSPAL



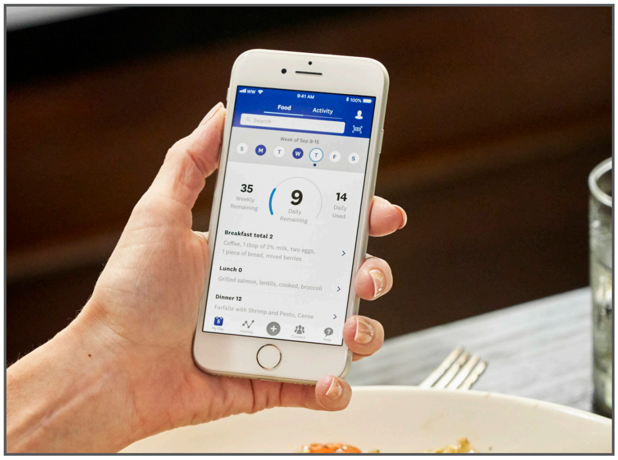
Year: 2015
Designed by: Albert Lee and Mike Lee

Description
MyFitnessPal is a smartphone app and website that **tracks diet and exercise to determine optimal caloric intake** and nutrients for the users' goals and uses **gamification elements** to motivate users. Users can either scan the barcodes of various food items or manually add them in the database.

Analysis
The app has **facilitator triggers** to make easier the behavior of counting the calories you're eating, also it **eliminates the pain motivator** of quantify the data thanks to their own scan for barcodes. As a **reward** the person can **share their goals with their social friends**. The problem is the feeling of obligation to confess the mealtime from the prospective of the users because if they forget to enter a meal the calories score doesn't work and people start to lose motivation.

6.4.3 HEALTHCARE (EAT WELL AND EXERCISE)

WEIGHT WHATCHERS

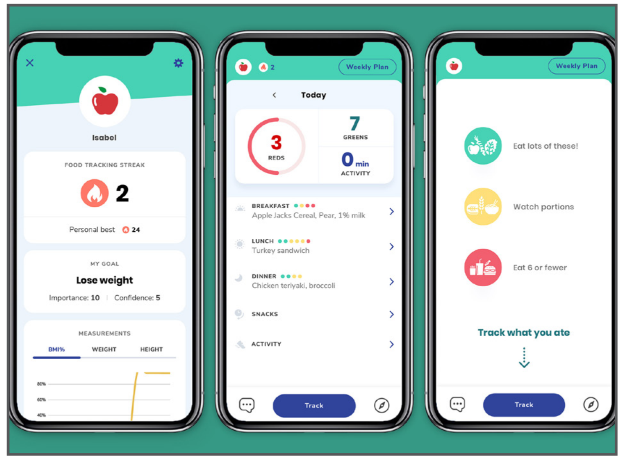


Year: 2015
Designed by: Jean Nidetch

Description
Weight Watchers is a company that offers services to assist with **weight loss and maintenance.** Their aim is to help participants lower their calorie intake by assigning points to foods based on their calorie, saturated fat and sugar content. The higher a food is in these components, the more "points" it has.

Analysis
The company achieve the goal of weight loss and maintenance through **facilitator and signal triggers** to count the calories and the **point rewards** to motivate people. Another important factor is the support of coaches at workshops or 24/7 in the app and the **social community**.

KURBOHEALTH



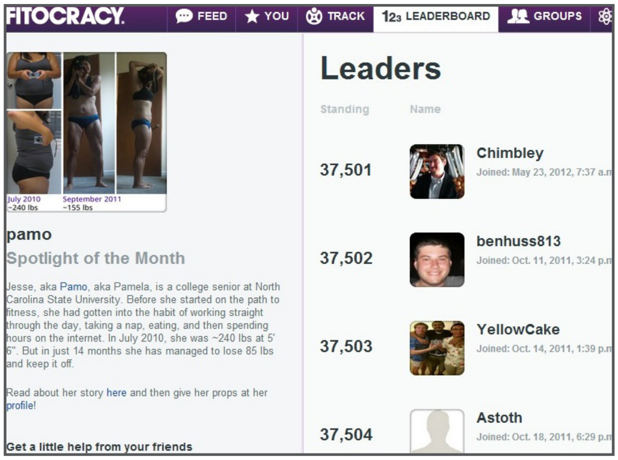
Year: 2014
Designed by: Joanna Strober

Description
Kurbo by WW is a free app that's intended for children and teens ages eight to 17. Designed around the longstanding Stanford University Pediatric Weight Control Program, the tool **encourages users to track their food intake and behavior while dispensing general tips regarding healthy lifestyles** and more specific guidance on skills such as reading and understanding food labels.

Analysis
Kurbo is one of the best apps for teach and track the food intake by children and teens. The app has the possibility once a week to talk with a coach to create an action plan to help their users reach their goal, these create **pleasure motivators**. Additionally, Kurbo has **signal and facilitator trigger** thanks to their semaphore strategy track.

6.4.3 HEALTHCARE (EAT WELL AND EXERCISE)

FITOCRACY



Year: 2011
Designed by: Richard Talens and Brian Wang

Description
Fitocracy is an **online game and social network** that helps its users to improve their fitness and achieve healthy goals through the **support of the community** of other users.

Analysis
The app use **gamification and social acceptance** as the key features of the **rewards** to introduce the fitness behaviors. Fitocracy also use **spark triggers** to keep people on track **using the "want to" behaviors instead of "haftas"**. Additionally, the users feel really good because have **pleasure motivators** thanks to the support of the community.

SPARKPEOPLE

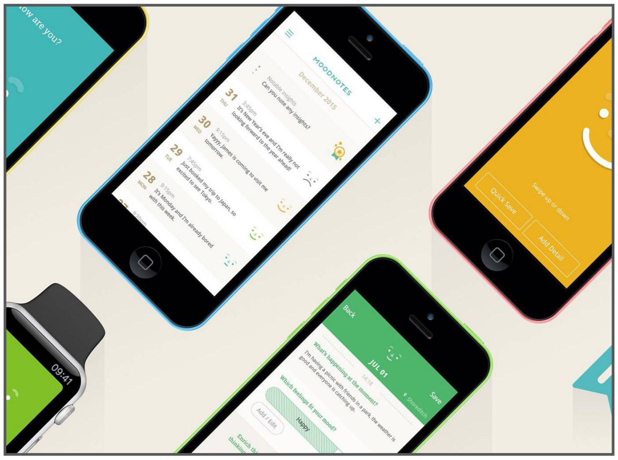
Year: 2012
Designed by: Chris Downie

Description
Sparkpeople allows you to **log your daily meals, weight and exercise with their user-friendly tracking tools**. Additionally, the app includes a barcode scanner for the food and an exercise demo component (this includes photos and descriptions of many common exercises) to do right the exercises.

Analysis
Sparkpeople look for keep on track any packet you eat. The app uses **facilitator trigger** and **signal trigger** to help their users add their information, also use **points rewards** for each goal achieve. Moreover, exist a social interaction thanks to the **online community**.

6.4.4 MENTAL HEALTHCARE

MOODNOTES

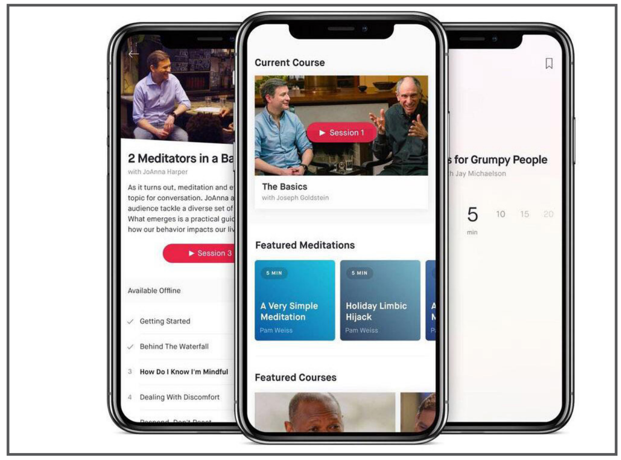


Year: 2015
Designed by: Ustwo team

Description
Moodnote is an app that help its users to **communicate how they're feeling**, and it **charts their emotions over time**. Additionally, it gives feedback on what they are feeling and has some challenges for them to improve positive thinking about some situations.

Analysis
Moodnotes aim is guide people to take **control of their emotional health and mental wellbeing**. The app collects helpful data about their user's mood and gets insights into their own thinking patterns to rethink their situation without traps to see if that change how they feel. This service use s**park and facilitator triggers**, has **acceptance motivators** and as a **reward people receive feedback to change their habits**.

10% HAPPIER



Year: 2016
Designed by: Dan Harris

Description
This app is **for people who are trying to be more mindful, sleep better, improve their relationships, become more productive and encourage topics like stress and anxiety**. 10% happier is a guide meditation, videos, talk and sleep content that help its users to build or boost their meditation practice and stick with it.

Analysis
The aim of 10 % happier is **build the habit of meditation** and teach how to do it. The app has **signal and facilitator triggers**, these are used as **reminder notifications**, their users can set them to make meditation fit into their schedule. For engaged its customers, they can ask and receive **recommendations by experienced meditations coaches**. This app also **periodically runs challenges**, and users can invite more friends for a free trial. Additionally, use **gamification techniques** to encourage you to keep going and build on your progress.

6.4.4 MENTAL HEALTHCARE

PIP STRESS MANAGEMENT

Year: 2013
Designed by: Galvanic team
Description
The Pip is a device that measures electrodermal activity (EDA) and allows you to see your changing stress levels, with engaging apps that **teach you how to recognize and manage stress**. Also, is a cognitive behavioral therapy.

Analysis
The principal goal of Pip is regarding a behavioral change in the **stress management by providing feedback while practicing short meditative sessions.** This device with the app has **facilitator and signal triggers** through the lights and the feedback obtained of each session its users can improve their stress. Also has **pleasure motivators** and **rewards like score points** when someone is playing against another user or against himself.

PROJECT FOCUS **OVERWEIGHT**

7. PROJECT FOCUS OVERWEIGHT

The problem chosen to work with is regarding overweight because people have bad nutritional habits and don't know how to keep a healthy diet; therefore, they lack knowledge about different actions that lead to a healthy life. This modern lifestyle problem is based on the matter that **people don't eat healthy, surrounded by many other facts in the environment that make people lean on fast food or pre-prepared food leading high consumptions of fat, chemicals and sugar.**

In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese.

Fast food chains such as Mc Donald's feed 68 million people per day (that's around 1% of world's population) and their revenue of Mc Donald's worldwide is 24.62 USD (Lock, 2019).
Nowadays nutrition and obesity are two main problems affecting population all around the world. According to a report of the World Health Organization worldwide obesity has nearly tripled since 1975. Most of the world's population lives in countries where overweight and obesity kills more people than underweight. These numbers are alarming and shows how important it is to focus on encourage people to follow a healthy diet.

Overweight and obesity, as well as their related noncommunicable diseases, are largely preventable.
Supportive environments and communities are fundamental in shaping people's choices, by making the choice of healthier foods and regular physical activity the easiest choice (the choice that is the most accessible, available and affordable).
Furthermore, it's important to understand the psychology behind, the habit routines and the emotions of overweight people to find the accurate reward to help them to create new healthy behaviors.

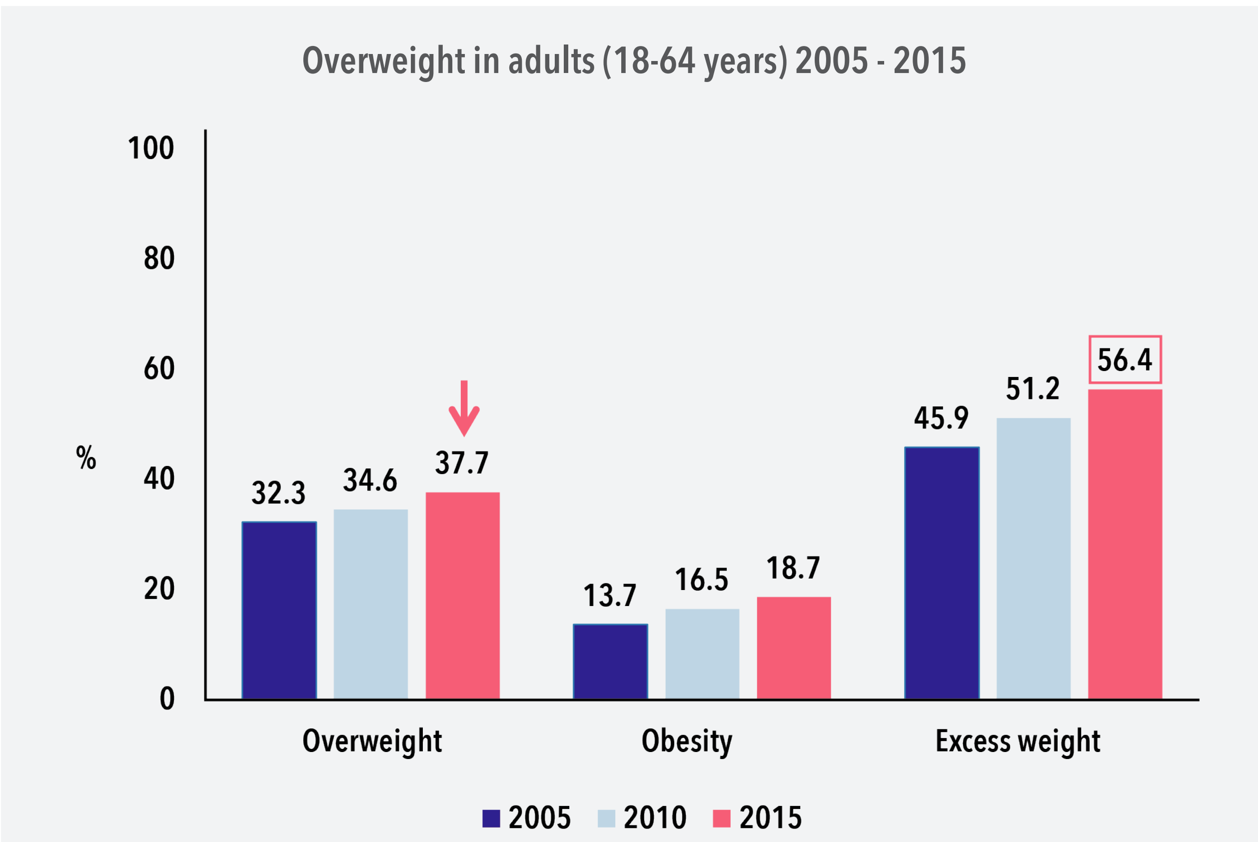
7.1 OVERWEIGHT IN COLOMBIA

The focus of this thesis is in Colombia, a country where recently studies have shown that almost the 20 percent of the population is obese. It's important to seek for new solutions to improve the currently health situation and change the nowadays numbers that are constantly increasing in issues related with the obesity.

In 2015 the Health ministry of Colombia made a Nutritional situation survey, in the result it was possible to identify that **one of five Colombians is obese**. In young people and adults overweight prevalence (body mass index, BMI, equal to or greater than 25) is 37.7 percent and obesity (BMI greater than 30), is 18.7 percent, for an increase of 5.2 percent in five years.

More than half of adults (56%) between the ages of 18 and 64 are in excess weight

GRAPH 1. Shows the excess weight in adults among 18 and 64 years in the last three surveys made by ESIN in 2005, 2010 and 2015.



Poor nutrition and obesity are the result of a lack of nutrients at all levels and a diet composed of flours. It's also the multi factorial consequence of a problem that comes from poverty, lack of education, cultural deficits and market trends (Escobar, 2019).

The dynamics of obesity differ between socio-economic levels, according to gender, age, environment and race (Zhang & Wang, 2004).

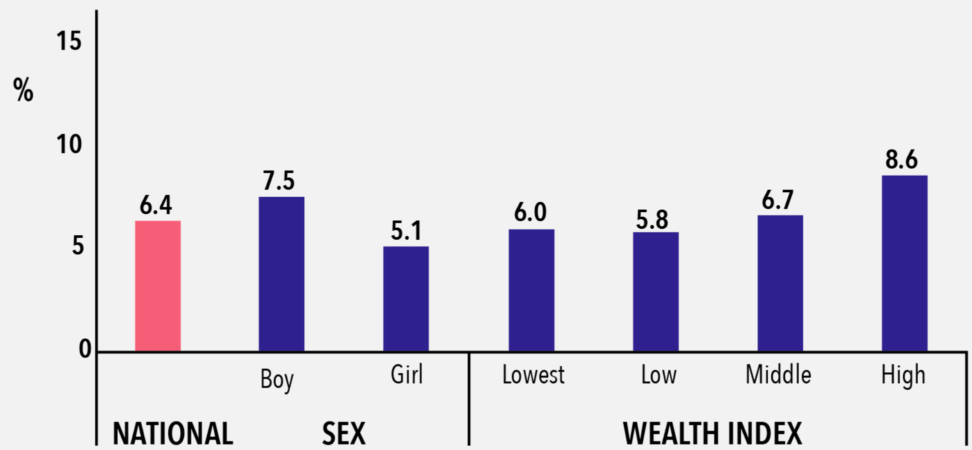
Furthermore, hungry people don't select their food regarding the quality they care about the quantity, in order to produce satiety; as a consequence they choose foods that cost little and fill a lot, with low nutritional intake.

7.1.1 AGE EXCESS WEIGHT ANALYSIS IN COLOMBIA

CHILDREN FROM 0-4 YEARS

The ENSIN 2015 results show that the highest prevalence of overweight was observed in boys compared to girls. Also there aren't major differences in weight index. The national excess weight is 6,4 percent

GRAPH 2. Prevalence of excess weight in children aged 0-4 by sex and wealth index

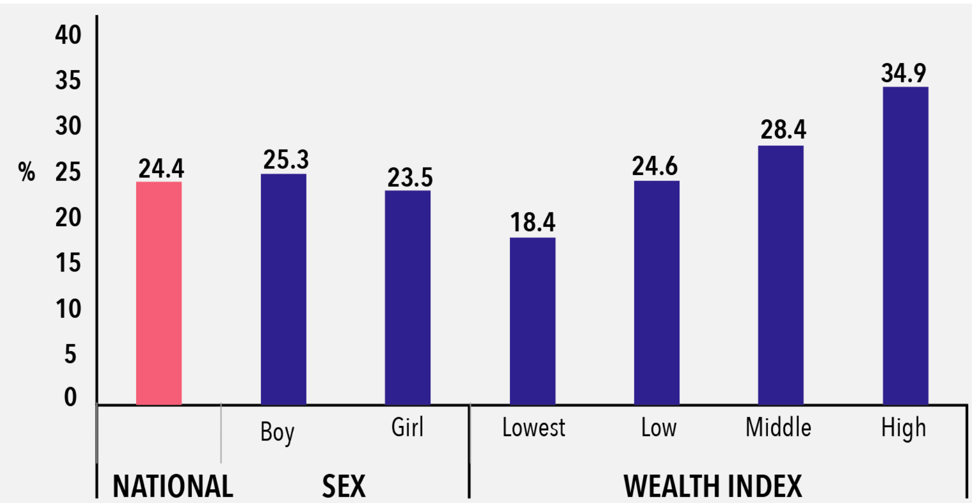


Excerpted from ESIN, Nutritional situation Survey results, 2010

CHILDREN FROM 5-12 YEARS

The excess weight of boys and girls of school age in Colombia has been increasing from 17,5% in the ENSIN 2010 to 24,4 in the ENSIN 2015. From the perspective of wealth index the population with more resources tend to have excess weight.

GRAPH 3. Prevalence of excess weight in children aged 5-12 by sex and wealth index

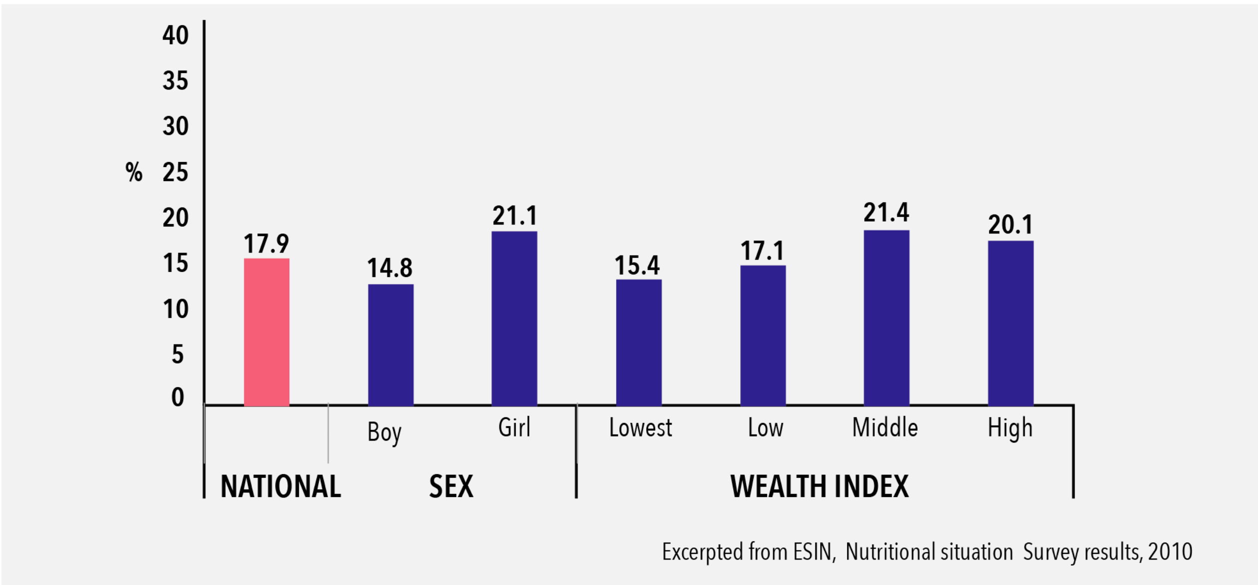


Excerpted from ESIN, Nutritional situation Survey results, 2010

ADOLESCENTS FROM 13 TO 17

Almost one in five adolescents (17.9%) had excess weight in Colombia, with a higher presence among women compared to men.

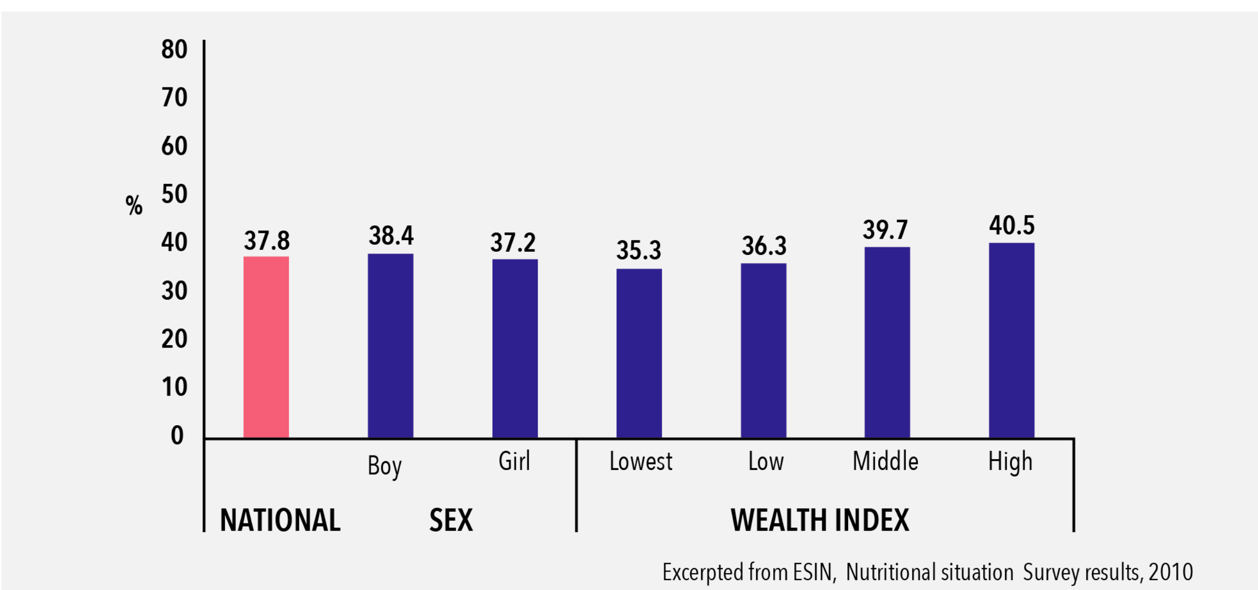
GRAPH 4. Prevalence of excess weight among adolescents aged 13-17 by sex and wealth index



ADULTS FROM 18-60 YEARS

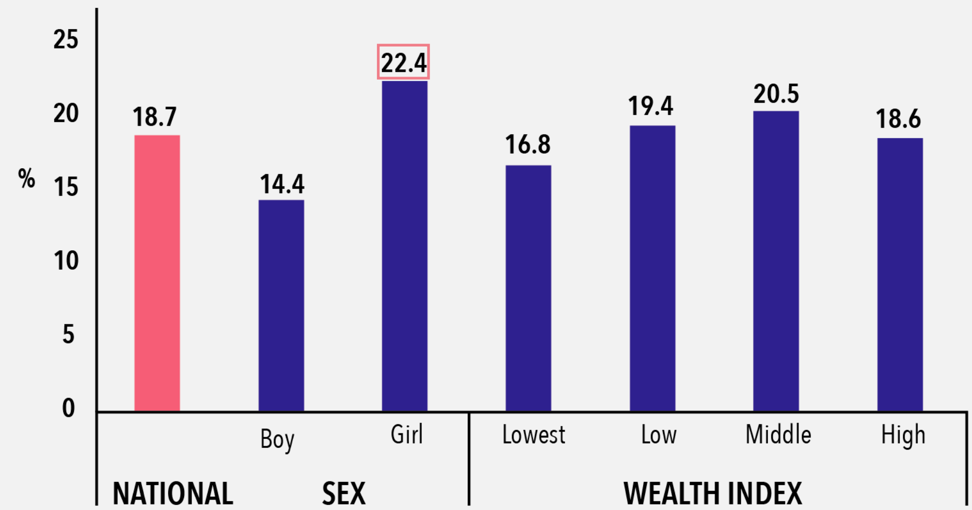
This is the population range with the highest levels of overweight with 37,8 percent. Additionally, it shows an increasing trend compared to ENSIN 2010. One in three young people and adults in Colombia is overweight

GRAPH 5. Prevalence of overweight in adults aged 18-60 by sex and wealth index



The women of this age tend to present more frequently obesity than men with 22,4 percent. Also, the index of wealth in this age are indifferent with the obtained results of obesity

GRAPH 6. Prevalence of obesity in adults aged 18-60 by sex and wealth index

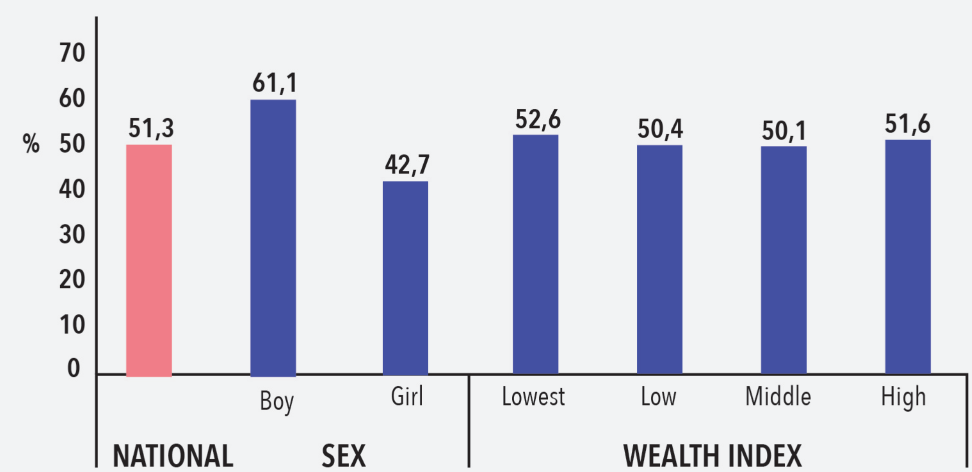


Excerpted from ESIN, Nutritional situation Survey results, 2010

The obesity is also related with physical activity, in Colombia the people between 18 and 60, according to ENSIN 2015 data, 51.3% of the country's population complied with the recommendations. According to the 2011 WHO recommendations, should be done at least 150 minutes of moderate intensity aerobic physical activity per week or 75 minutes of vigorous aerobic physical activity per week or a combination equivalent to moderate intensity aerobic physical activity or vigorous (World Health Organization, 2011).

The graph 7 shows inequalities according to results by sex, given that women had a lower prevalence of compliance with recommendations compared to men.

GRAPH 7. Compliance of physical activity recommendations by sex and wealth index



Excerpted from ESIN, Nutritional situation Survey results, 2010

7.2 INTERVIEW OF PROFESSIONALS WORKING WITH OVERWEIGHT

A interview was carried out on nutritionist, physical trainer, a psychologist and a sports doctor. They were asked to answer 6 questions oriented in their expertise area, with the aim to have a better understanding how should be the treatment for a person with overweight. The next paragraphs show the questions made and the answers given by each professional.

NUTRITIONISTS

Claudia Lleras and Gloria Gomez.

1. How does treatment work for an overweight and obese person from the nutritional side? What is advised?

To have a balanced and healthy diet, it must be accompanied by exercise (at least 30 minutes a day).
Healthy nutrition requires to be varied and balanced avoiding consuming packaged and sugary products.
The concept of snacks is being abolished, they should be consumed in good portions the three meals of the day. Breakfast is expected to be accompanied by a protein, a carbohydrate and a fruit. A protein, a carbohydrate and vegetables will be consumed at lunch. At the dinner a protein, a carbohydrate and vegetables is also required to be eaten. The secret is to eat the right portions without exaggerating, the size of the dish can also influence.
A balance diet must be done regarding the preferences of each user. When the person feels part of the decisions made to develop a diet, he will feel free to choose when he has to eat; usually people made some mistakes because prohibiting food seems more attractive.

Recommendations for a good diet:
• You should be given a training on what to eat and on what portions.
• Take the time to eat and not run (between 15 and 20 minutes).
• Savoring food and giving it the importance that eating is a pleasure, actually counting calories diverts people from this feeling.
• You should eat and not do another activity, because when you do another activity like watching TV, you are not aware of what you eat.
• Change bad options for healthy ones, it means you will have Plan A or Plan B only with healthy food, and you don't feel bad for the temptation of eat junk food.
• Staff off by finding out what your personal foods trigger are and make a promise to not keep them in your house anymore, so when the time comes the decision has already been made for you. That's how you make healthy eating a default and not the exception. You can eat that food may be in special occasions or events but not often.

2. The excess weight with which it is associated?

Being overweight is associated with not eating balanced meals, exaggerating in the portions of each meal, eating lots of sugary and packaged foods.

3. What does an overweight person think?

Many times they think they are hungry all the time and don't know how to control that anxiety, they also think they eat healthily because they don't know a balanced diet and its portions.

4. If this problem is a chronic disease, how is it helped to avoid it again?

It's required to teach the patient to eat healthy and is important to lose weight in a normal process, it means lose around 3 or 4 kg per month.

5. If the motivation part is very important for the person to continue the process, what are the determining factors and actors to motivate them?

One important argument to motivate people is to remove the barriers for your success. It's important to set the environment that works for you, instead of against you, this work well for any goal.
Exist also the cheat meal, so the person has a goal of eat healthy during the week, if he has achieved that goal, in the weekend can have his dream meal it can be junk food or whatever he wants and he can enjoy it without having any regrets. The next meal after the cheat meal should be healthy.

6. Being a disease treated by various professions

such as the sport doctor, nutritionist, physical trainer and psychologist, do you talk to each other to help the person or each one works in your area in an individualistic way?
The nutritionist gives the recommended diet and works with the physical trainer sometimes.

PHYSICAL TRAINERS

Diego Mendoza and Lucero

1. How does treatment work for an overweight and obese person from the physical part? What is advised?
It's important to know the background and psychological scope to understand what's behind each user (technique of 5 whys).
If a person is disciplined at three months he sees the results, but many people expect to see them in the first two weeks and lose motivation very soon. Therefore it is very important to explain to the person that the results will not be in a month, besides there will be a time of adaptation, of exploring his body and of a change of emotions.

The process of having a physical activity depends on the preferences of the person and can be performed in different modalities such as functional training, military training, Yoga, Pilate, among others.
It is essential to know the barriers of each person as the time so that activities can be readjusted to start the process.

Process:
In each phase explained below it is important to look at the progress and achievements

• First month or month and a half: Ideally people should exercise three times a week.
In this phase the body needs to condition itself to acquire muscle strength and avoid injury (it may present cardiovascular fatigue, a margin of pain but through the days is a more friendly pain). The first month is crucial to guide the person to continue because this is where the habit is created.
• Second month: Strengthening, resistance and flexibility are worked.
• Third month: It is a phase where people go to do what they want, tone, increase muscle mass or if they want to lose weight.
Recommendations in the process:
• Create short- and long-term goals.
• Show how a wrong exercise is done and how well it is done.
• Is better exercise in the morning because you have more energy at the beginning of the day, but it is not always possible because depends on each person's lifestyle.
• The three meals of the day must be accompanied by protein because it allows the muscle to be built.
There are three different constitutions of the body, this is related to the way each person should be exercised and fed, these are:
- **Ectomorphic people:** They are thin, for that reason eat a lot, but it does not mean that they can eat whatever they want because they can tend to be skinny oily. These types of people should not do cardiovascular exercises because they can lose weight, and if they eat properly they can eat larger portions.
- **Mesomorphic people:** They are people who are in the middle, if they are not taken care of them, they can be fattened.
- **Endomorphic people:** They are fat people who have trouble losing weight and they are the ones who have to take care of themselves with food.

2. The excess weight with which it is associated?

In the physical part it is associated with maintaining a sedentary life and not meeting the standards of doing at least 150 minutes of exercise per week. It also influences not having a balanced diet.

3. What does an overweight person think?

Some people are unsure of themselves and are shy for doing different activities.

At the beginning of the process the person is insecure to think if it's really worth it, but as he feels better with his body, he modifies his thinking in a positive way and sees change as a tool he needs.

4. If this problem is a chronic disease, how is it helped to prevent it from recurring?

Help them create the habit of eating well and exercising as a routine.

5. If the motivation part is very important for the person to continue the process, what are the determining factors and actors to motivate them?

• It is essential to know how he did and how he feels after each session.

• Receive feedback based on his process, example: remember that you used to get tired after 5 minutes and today you can run 15 and you don't get tired.

• Motivate and prepare the person for their next session.

• Knowing how the person is before starting his training, if he is tired you can persuade his mind by telling him to use another method but you do the same thing that was planned only in another order.

6. Being a disease treated by various professions such as the doctor, nutritionist, physical trainer and psychologist, do you talk to each other to help the person or each one works in your area in an individualistic way?

Currently if you want to see results the physical trainer works and shares information with a nutritionist.

PSYCHOLOGISTS

Maria Camila Londoño and Patricia Hernandez

1. How does treatment work for an overweight and obese person from the psychological side? What is advised?

From the psychology side you can help the patient in two ways, the first is from the counseling part (once a month) to help him change habits; the second, if the person suffers from anxiety, low self-esteem or some disorder, it requires therapies (once every 8 or 15 days). The treatment is different for each person, because each body brings its own story and emotions of which it's defending. In addition, it should last in time (at least one year) aren't enough just two or three appointments because to change a habit it's important to learn about the good habits, put them into practice, correct them and have a time of adaptation to see results.

To start the process it's important to know how the emotional state, sleep, feeding, and exercise habits are.

Additionally, self-schemas are worked, these help to know how the patient seems himself, if he feels good in the things he is doing in his life.

The treatment works by strengthening your self-esteem, the image you have of yourself, the acceptance you have of your body. The psychologist serves as an accompaniment to give you ideas and tasks to strengthen your self-esteem.

Some recommendations task are:

- Make two lists, one with things you think are not right in the physical, emotional and mental part and another with things you think are right.
- Looking in the mirror without looking at your weight, instead focusing on discovering other qualities, thinking about how I can highlight what I like.Say that you are pretty.
- Asking a friend or someone close to you, what he sees positive in you, this works to highlight things you don't see in yourself.
- Challenge yourself to belong in a new social group (sport, music, theatre or some external activity you like).
- Draw yourself on a sheet.
- Write during the week things you want to tell the psychologist, because many times people forget half of the information they want to talk about.
- Learning relaxation and breathing techniques, this works when you are stressed or anxious, meditation is a good idea.
- Regarding food anxiety, the person should take time to think if he is emotionally hungry (it's time

to eat, has really hungry and is patient), or if it's physically hunger (it appears at any time, are cravings or is an excuse for not suffering from gastritis).

- Reduce consumption of packaged products and sweets gradually. Sweets can be controlled.
- It's important to control portions, to check if the establishment healthy diet is met, that is have vegetables, flour and protein.
- When there is some food that isn't on the list given to follow in the diet and the person has doubts, calories and the knowledge to interpret the labels of the products serve to know which option is healthier but it's important not to obsess with these.
- When it comes time to eat just focus on doing this activity, it's time for yourself.
- Control the speed at which you eat. In 20 minutes you feel satiated.

2. The overweight with which it is associated in the psychological part?

Being overweight is associated with the difficulty of adjusting and releasing what is emotionally not for the person to carry. In addition, it is related to a need to punish for a bad image that the person has of himself, all this occurs on an unconscious level.

The person who is overweight also may suffer from anxiety, depression or take refuge in food to try to overcome a situation that is going through some grief (loss of employment, of a loved one or a part of his body).

Overweight is a symptom that something is not working, it can be a person who when he is sad eats, this refers to being someone who can't control his impulses or his emotions.

Many times it's also associated with protecting himself, people who in their childhood suffered from sexual harassment or abuse, grow up protecting their body by developing a layer of fat around them, seeking for not being attractive and not suffer those feelings of abuse again.

3. What does an overweight person think?

What an overweight person thinks is that he is someone who is not worth it, who has no value to society, his family and his group of friends. It's a vicious chain because the person looks at himself in the mirror, doesn't like the way he looks, so he doesn't care if he consumes one more candy, so he eats it, then feels guilty and repeats the same process again.

He is a person who knows that is in overweight, looks fat, usually feels a lot of annoyance and anger about her body and figure. Frustration is another sensation that they present, because the whole world tells them that it's very easy, they just have to eat less and exercise but this is something they don't manage to do, or even if they do, not work out.

Many times they think they're garbage, they're not even able to have a good body, nobody looks at them, they're unattractive, they have to cover up their body and wear big clothes.

They are also people who don't want to be social exposed because according to them, they don't meet the standards or beauty that exist in their culture.

4. If this problem is a chronic disease, how is it helped to avoid it again?

To avoid this disease again education is important because usually people don't know how to change their habits, you don't change habits for a month or for a vacation, you change habits for your life and diets are just for a moment. People are not aware of their bad habits and these come from the habits they have in their home, an example is always consuming juice in meals, as this is not advisable because the fruit is consumed three days in one.

To change habits the person needs to discover what works for him and what doesn't , also be aware of how he can begin to correct his lifestyle. The person requires time to adapt and sees results.

To don't repeat this state, is essential to strengthen the self-esteem. When someone feels good he is able to maintain his figure.

5. If the motivation part is very important for the person to continue the process, what are the determining factors and actors to motivate them?

Factors that motivate the person to continue are very relative. It's important to know where he wants to arrive, what is his real motivation goal. Some purposes examples are:

- He wants to lose weight.

- He wants to see himself better.
- He wants to play with his grandchildren.
- He wants to sleep better because actually he can't.
- He wants a better quality of life without feeling sick.

One way to motivate is to inform them of the benefits of losing weight, these are:

- Lower your medication intake.
- Have a better quality of life.
- Don't feel so tired.
- Prevent other diseases.

To motivate them it's necessary to teach them that they have to change their habits and this can be achieved by following the given recommendations and developing a plan where people's preferences are integrated; because it's not forcing them to do things they don't want, like going to dance classes instead of a gym.

Another motivation in the case of feeding, is to help the patient to decrease the consumption of some unhealthy food gradually, because if you take it off overnight, he will lose the motivation to continue with the treatment, the key is to reduce consumption by setting a limit. It's a process of lowering products, decreasing them for days and weeks until the person is aware that he doesn't need it.

In psychology, the motivation for a patient to return to therapy is related to build a relationship with the therapist, have respect, have credibility.

6. Being a disease treated by various professions such as the doctor, nutritionist, physical trainer and psychologist, do you talk to each other to help the person or each one works in your area in an individualistic way?

Unfortunately, I'm not part of a team where there is constant communication with other professionals who work the same disease of an overweight patient.

But those who come to my services are referred to a nutritionist that I work with. I also refer this person to do some kind of exercise depending on what he wants and with an assessment from a doctor.

DOCTOR

Guillermo Diaz

1. How does treatment work for an overweight and obese person from the medical side? What is advised?

Each person has a basal metabolic rate, this is the energy that the body needs to survive performing the basic activities such as breathing, pumping the heart, walking, etc. It is necessary to perform the calculation of minimum calories that the person needs to live and depends in addition, on the physical activity that the person has: mild, moderate or strong level of exercise.

The person loses weight, having a diet where fewer calories are consumed corresponding to the basal metabolic rate distributed in the three meals of the day and doing exercise. Foods consumed daily should have quality calories, this refers to consuming 100 calories of broccoli, instead of eat 100 calories in jelly beans.

The advantage of exercising and losing weight is that it helps to lower the high levels of sugar, cholesterol and triglyceride.

Some recommendations given are as follows:

- Drink water to feel satiated and when it is time for meals do not consume so much.
- Have more physical activity in your daily routine, for example: climbing stairs instead of taking the elevator, walk over small distances instead of using the car, perform dance activities among others.
- Regular exercise, this can be chosen depending on preferences to stimulate the person.
- Diet should not be restricted, that is, if you like something you can eat it at one meal, but calories should be restricted at another meal.
- It is necessary to have a basic minimum exams that rule out diseases, are strictly required for people over the age of 40, these exams are:

-CBC test.
-Glycemia pre and pos
-Complete lipid profile (triglycerides, cholesterol, HDL and LDL)
-Kidney function tests (creatinine and partial urine)
-Electrocardiogram

2. The excess weight with which it is associated?
Stress, overeating, and lack of exercise are associated with overweight.

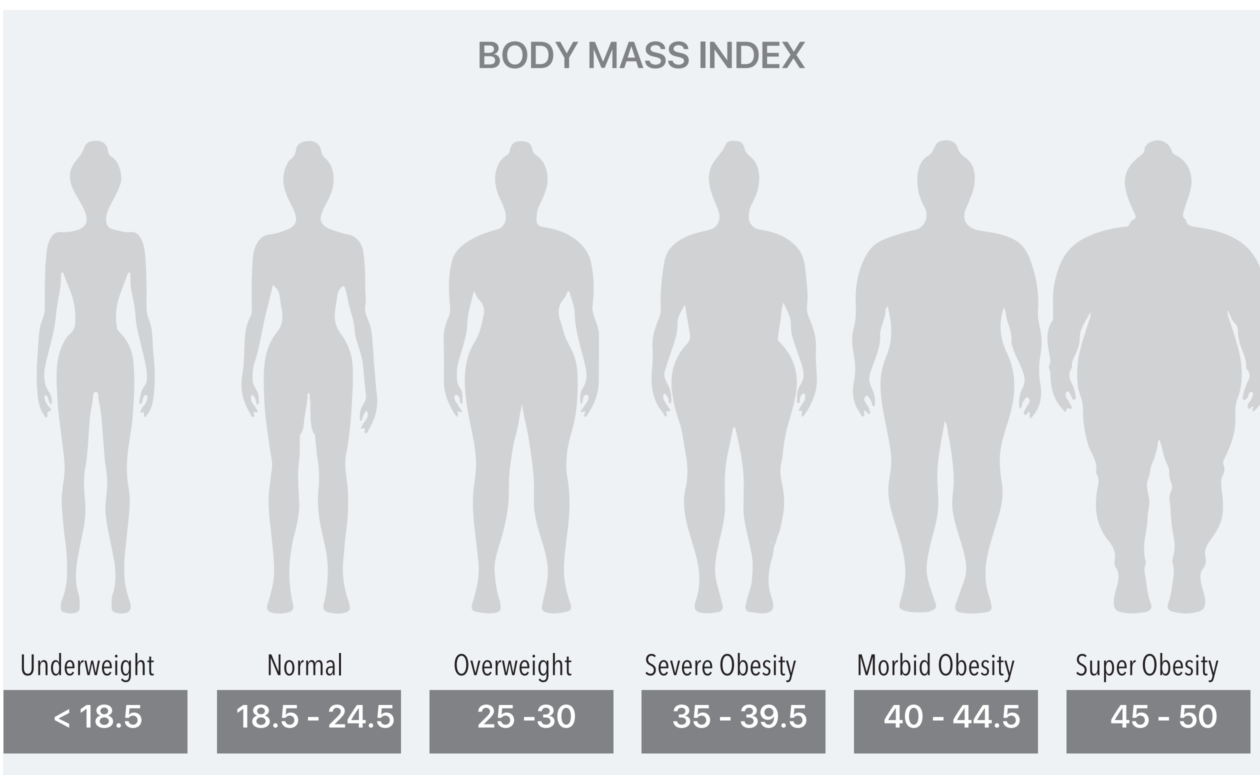
3. What does an overweight person think?
If people are overweight they don't see the need to lose weight because they're used to looking themselves like this. That is why it is important to let the patient know other diseases that can be caused by being overweight or obese to create awareness, these are: hypertension, diabetes, cancer and cardiovascular diseases (acute myocardial infarction and stroke).

4. If this problem is a chronic disease, how is it helped to avoid it again?
It needs to become routine to exercise and eat well for life. An added value of exercise is that with sweating it helps detoxify the body, as a consequence the person will be less stress.

5. If the motivation part is very important for the person to continue the process, what are the determining factors and actors to motivate them?
• Stimulate the exercise the person likes.
• By losing weight with diet and exercise the patient feels more energetic, more active, sleeps better, improves taste with feeding, releases a substance in the body that is called endorphins that keep him calm and relaxed.
• By doing physical activities in a group you can improve your relationship with other human beings and meet new people.

6. Being a disease treated by various professions with a sports doctor, the nutritionist, physical trainer and psychologist, do you talk to each other to help the person or each one works in your area in an individualistic way?
These interdisciplinary groups are found basically in clinics where obesity is studied.

FIGURE 18. For a better understanding of types of obesity, it is measure depending of the body mass index.



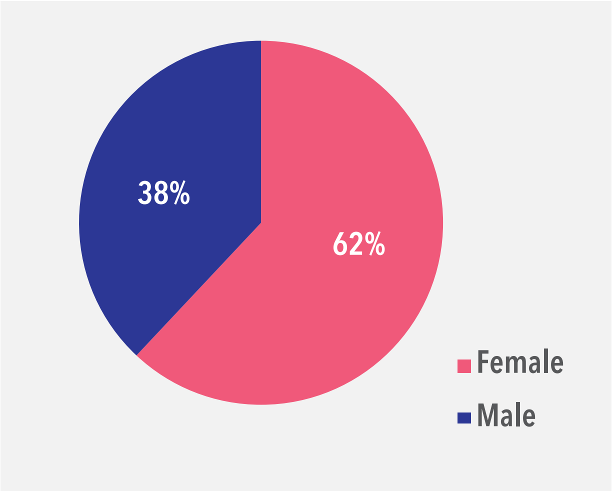
7.3 EATING HABITS RESULTS SURVEY

After a deep analysis of the excess weight data, as the studies show the most vulnerable population in overweight and obesity is the age range of 18-60 years. For the argument mentioned before the user group selected to focus in this thesis is around 18-35 years.

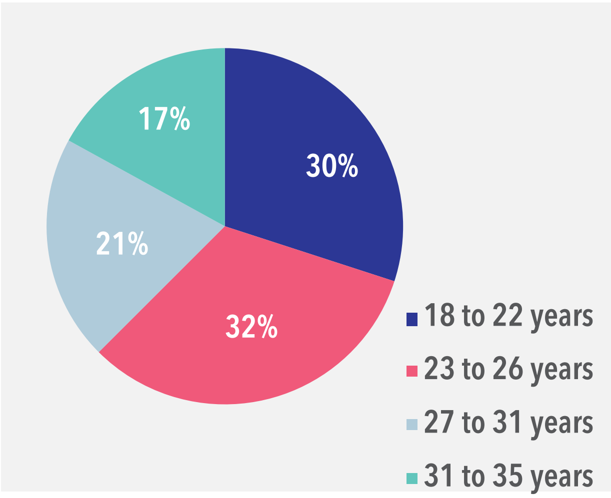
To understand better this group, a survey of 200 Colombians around 18 to 35 years was made by me to know better the different eating habits they are having during the day, it was also taking account for the development of the survey, the answers and recommendation of the professionals survived. The next graphs demonstrate the results about how these folks are actually interacting and making their choices related to the food intake and cook.
The persona created is based on this data.

The graphs 7,8 and 9 show that the majority number of people that answered the survey are female among 23 to 26 years and work.

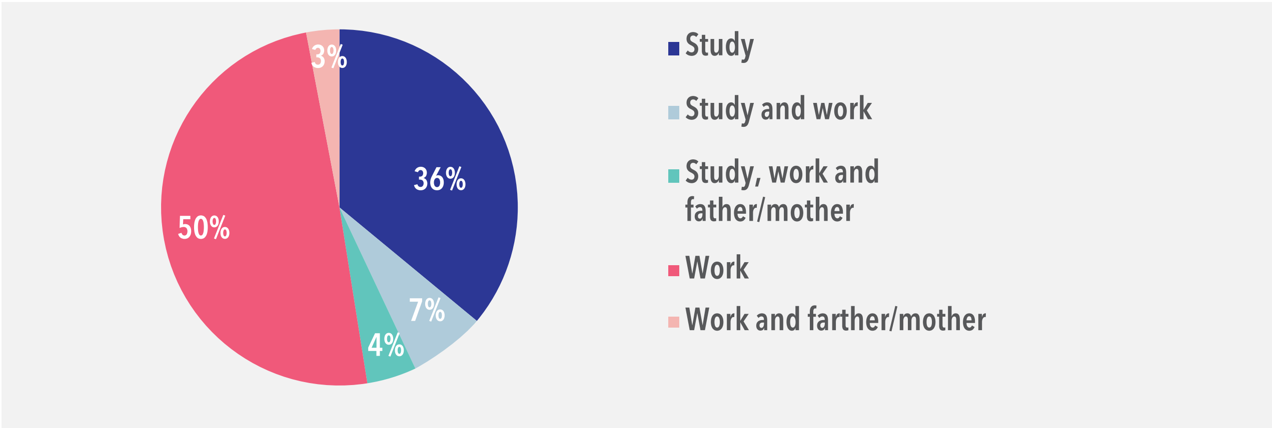
GRAPH 7. Gender



GRAPH 8. Age



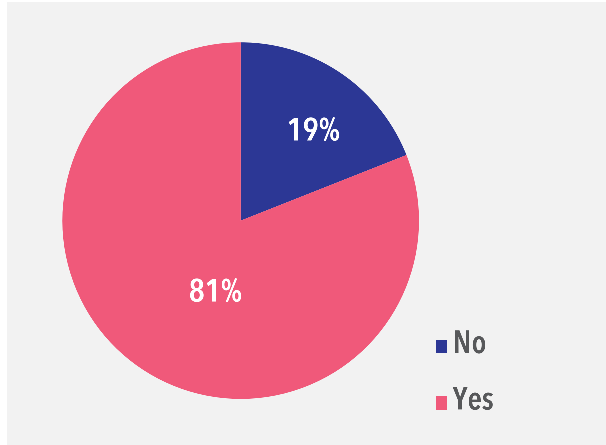
GRAPH 9. Occupation



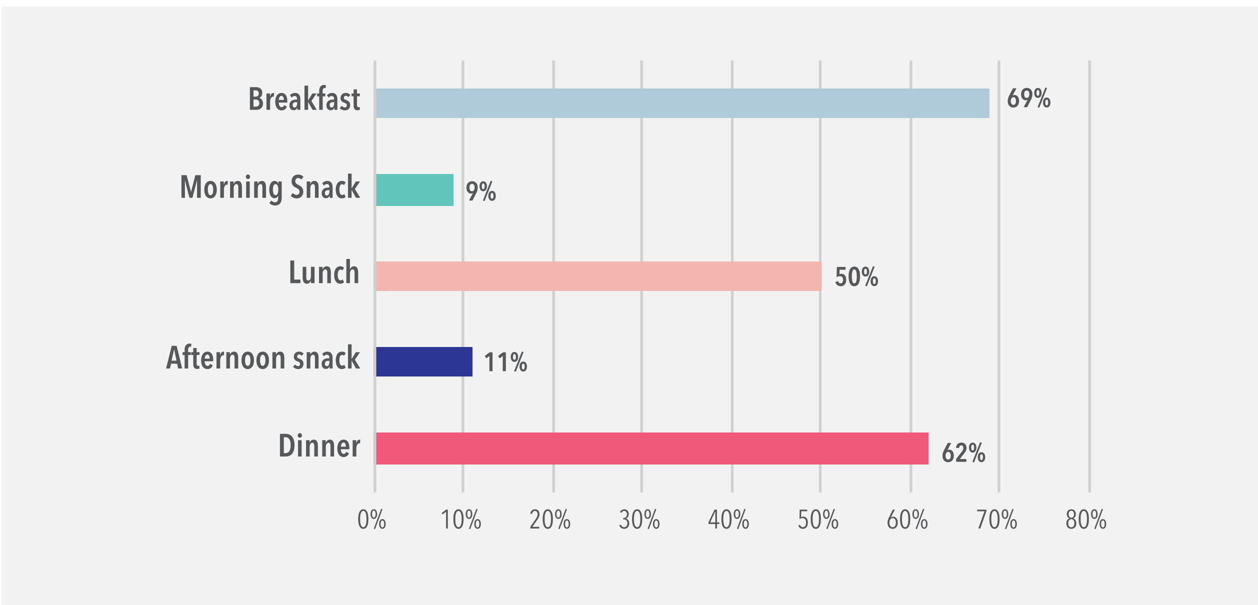
The graphs 10,11 and 12 indicate that 81 percent of the people cook, the average time to prepare each meal is between 30 and one hour and the most cooked meal at home is breakfast, followed by dinner. As the nutritionist mentioned, eat well can be control cooking the food at home.

Also, a study made by Nielsen (2016) explained that 76 percent of Colombians are likely to eat their lunch outside, this trend is verified also by the survey carried out.

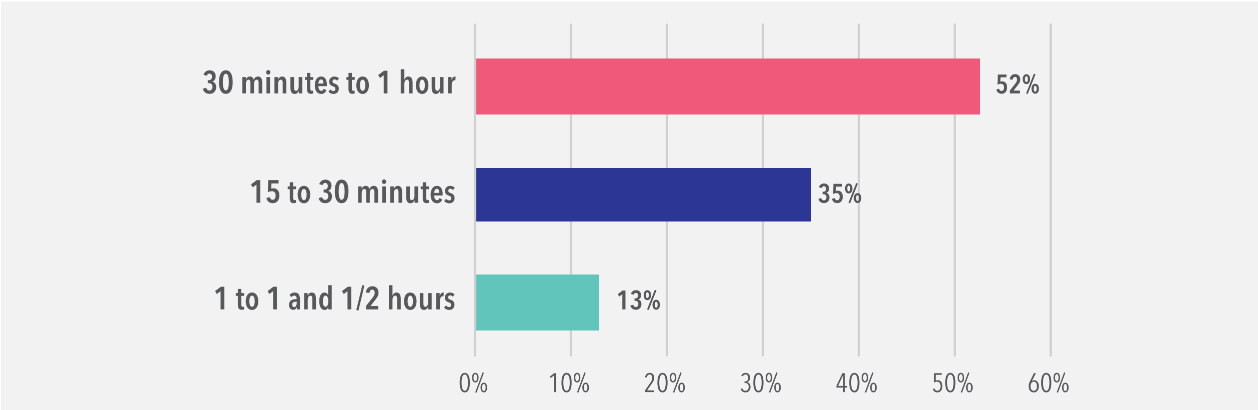
GRAPH 10. Cooking at home



GRAPH 11. Meals cooked at home



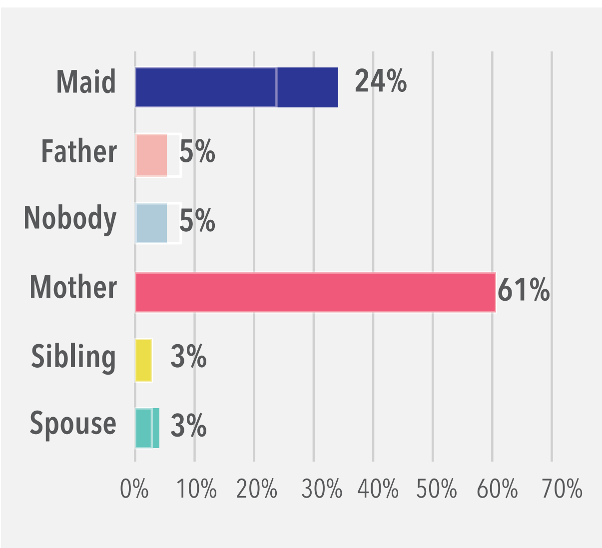
GRAPH 12. Time cooking



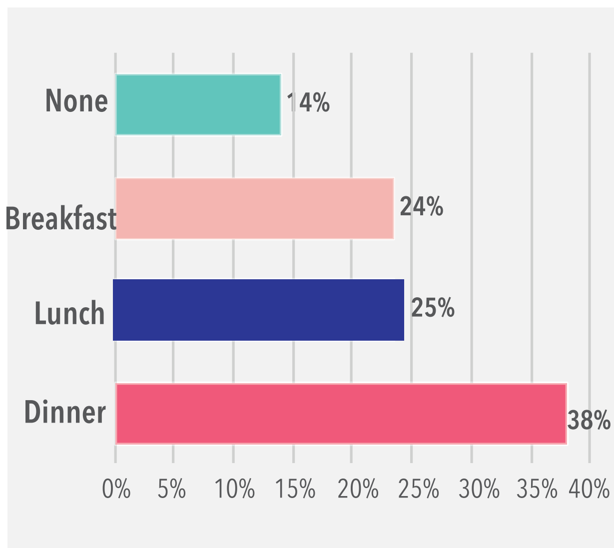
For the people who don't cook, they were asked who cooks for them at home, and the common answer was their mom.

Some studies recommend eat one meal per day in family or in company because is good for the health wellness. The dinner is the Colombian time meal to share with others, graph 14 shows it.

GRAPH 13. People who cook at home

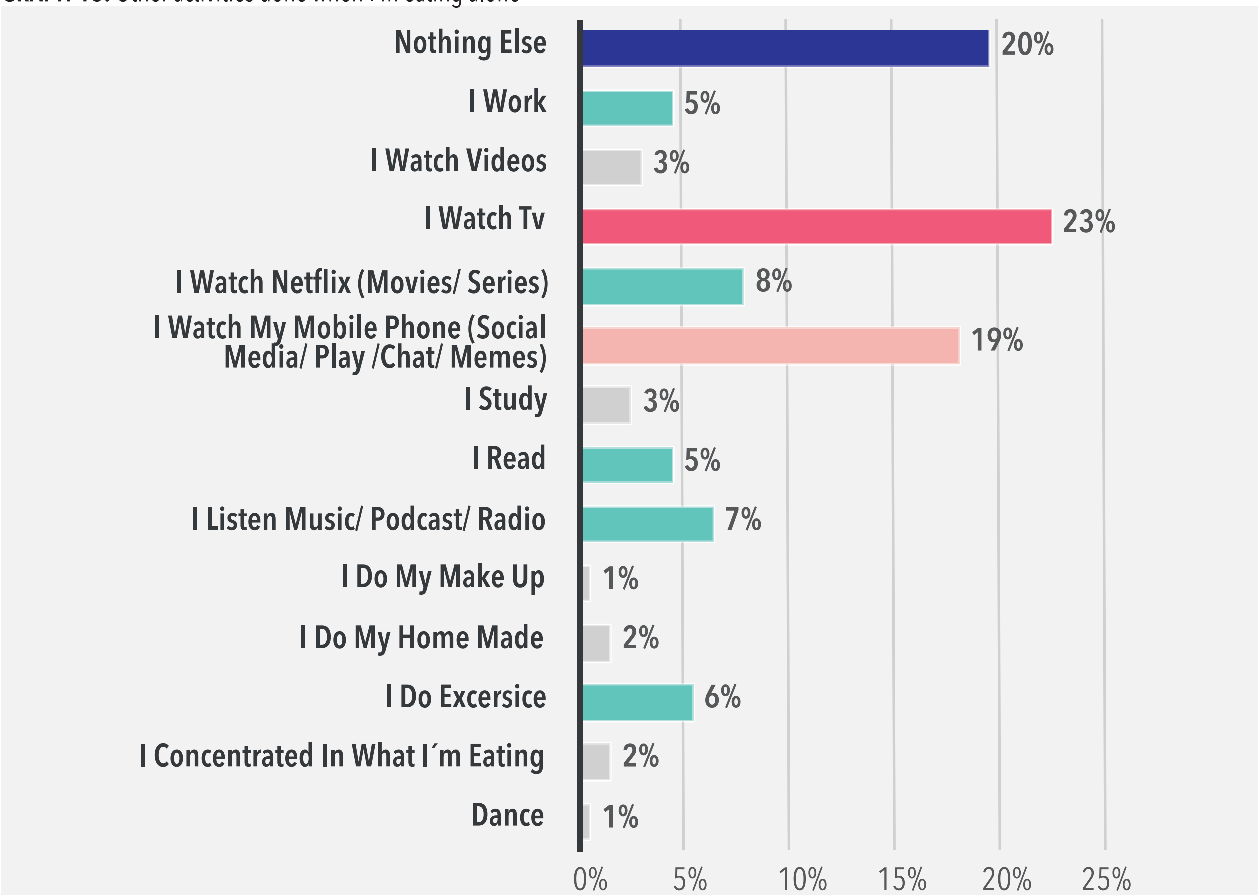


GRAPH 14. Meals in company



Another important factor of health habit as it was said by the nutritionis is trying to only eat when you are eating, but often persons do more actions, graph 15 confirmed it with alternative activities like watch TV or watch the mobile phone.

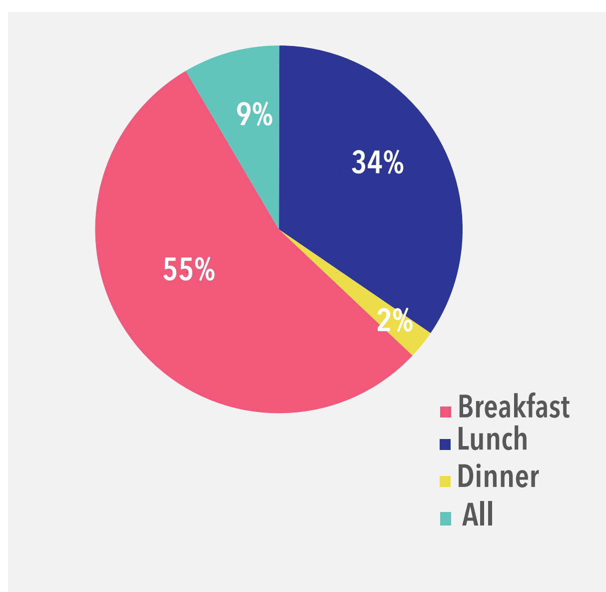
GRAPH 15. Other activities done when I'm eating alone



In Mediterranean countries, breakfast has been recognized as the most important meal of the day (Affenito, 2007), because help to improve mental alertness and physical performance (Imberman & Kugler, 2012), is associated to provide the 25 % of energy and nutrients of the day. Also helps manage the hunger, cravings and will promote better food choices throughout the day.

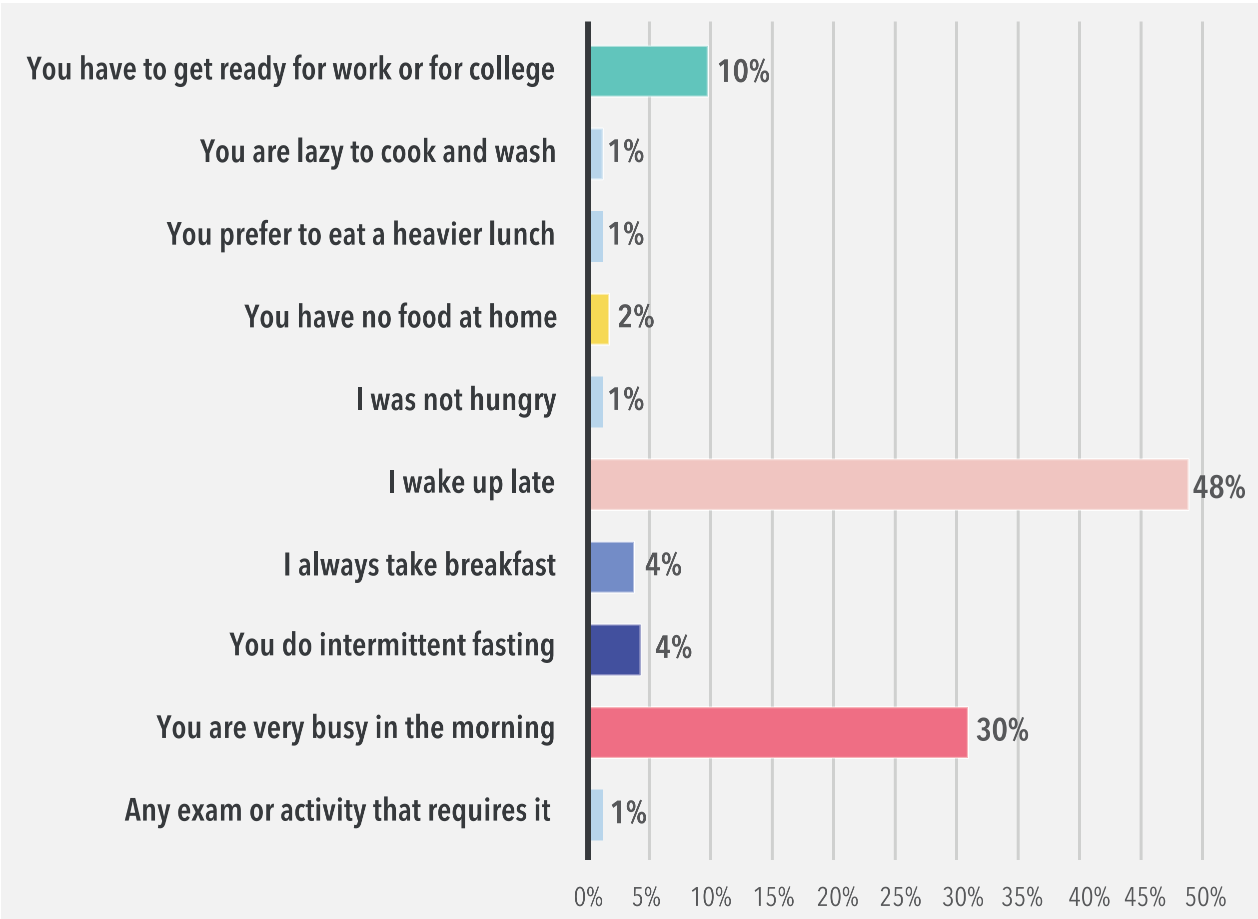
For the argument mentioned before in the survey was asked which meal is considered the most important and Colombians think is breakfast, see graph 16.

GRAPH 16. Which meal is the most important



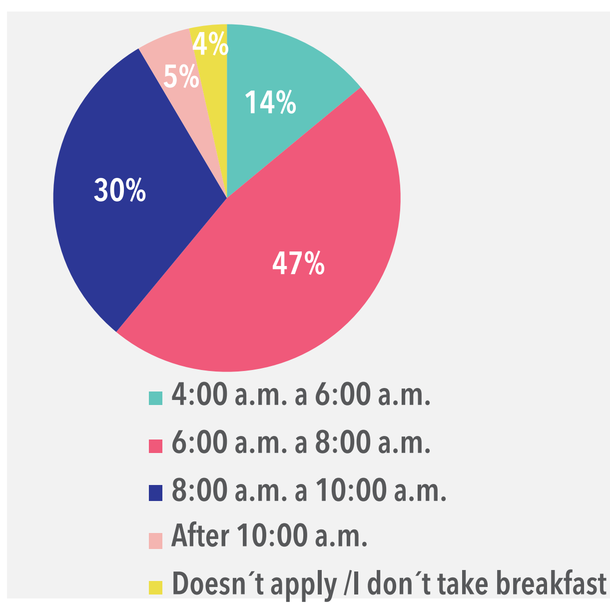
Sometimes people skip breakfast, but this is not a frequently problem in Colombia, a study made by Nielsen group (2016) shows that 93 % of Colombians eat it. In the survey I asked the motivations to skip breakfast and the most common reasons are regarding people wake up late and are very busy in the morning, see graph 17.

GRAPH 17. Reasons why people have ever skipped breakfast

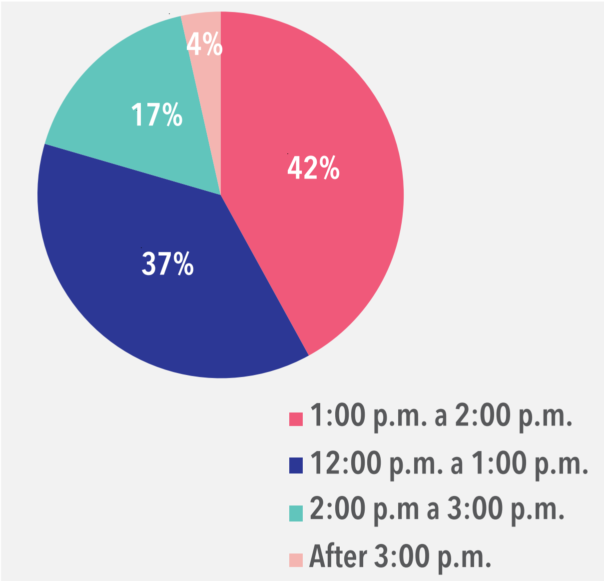


Part of good habits is eating meals at specific times, as the sport doctor mentioned in the interview: breakfast from 6:00 a.m. to 8:00 a.m., lunch from 12:00 p.m. to 2:00 p.m. and dinner from 18:00 p.m. to 20:00 p.m. The Colombian meal schedule for the people between 18 and 35 is right for breakfast and lunch but for dinner the trend is to eat from 20:00 p.m. till 22:00 p.m. See graphs 18,19 and 20

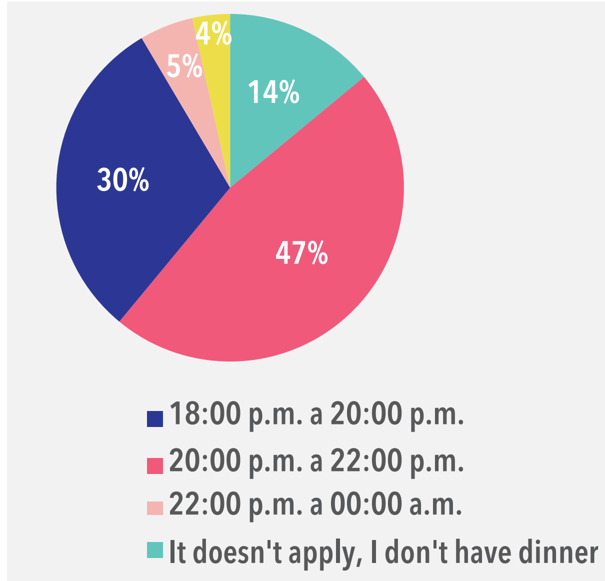
GRAPH 18. Time breakfast is taken



GRAPH 19. Time lunch is taken



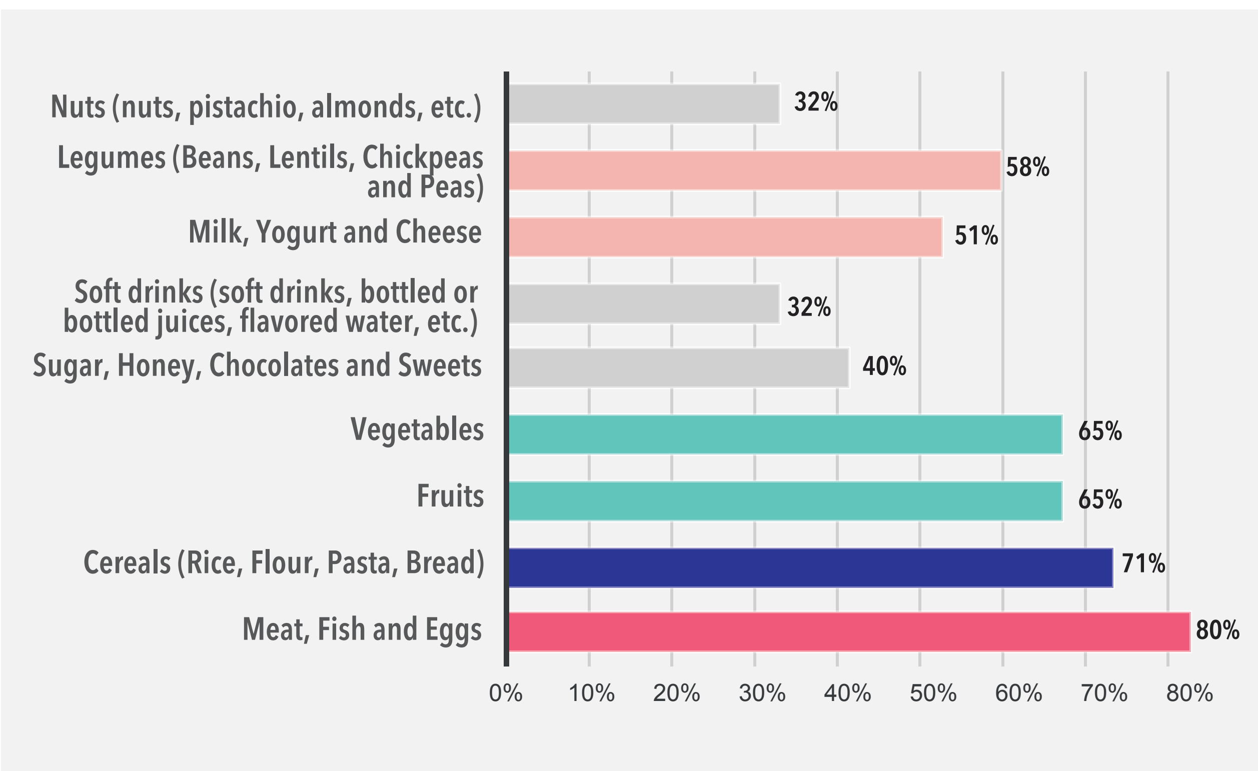
GRAPH 20. Time dinner is taken



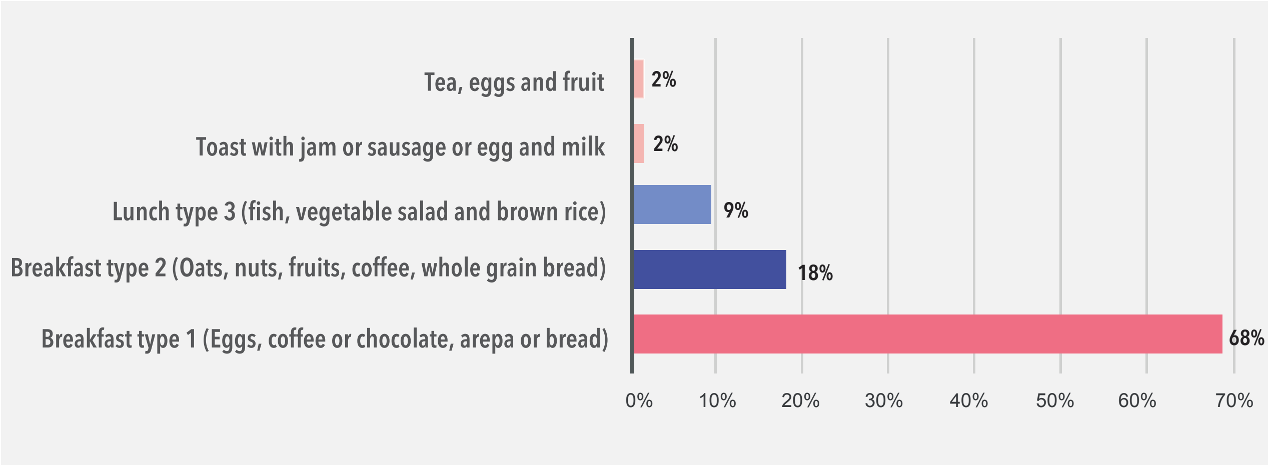
Colombian's food preferences are evidenced in graph 21. Graph 22,23 and 24 indicate the meals with which people feel better identified in their daily diet.

There is a correlation in what the segment manifests as daily intake, with respect to meals at breakfast, lunch and dinner. Where the predominance in food is protein, starches, carbohydrates, cereals, fruits and vegetables. The nutritionist recommend for lunch and for dinner to eat one protein, a carbohydrate and vegetables; but usually , colombians eat more carbohydrate than are recommended.

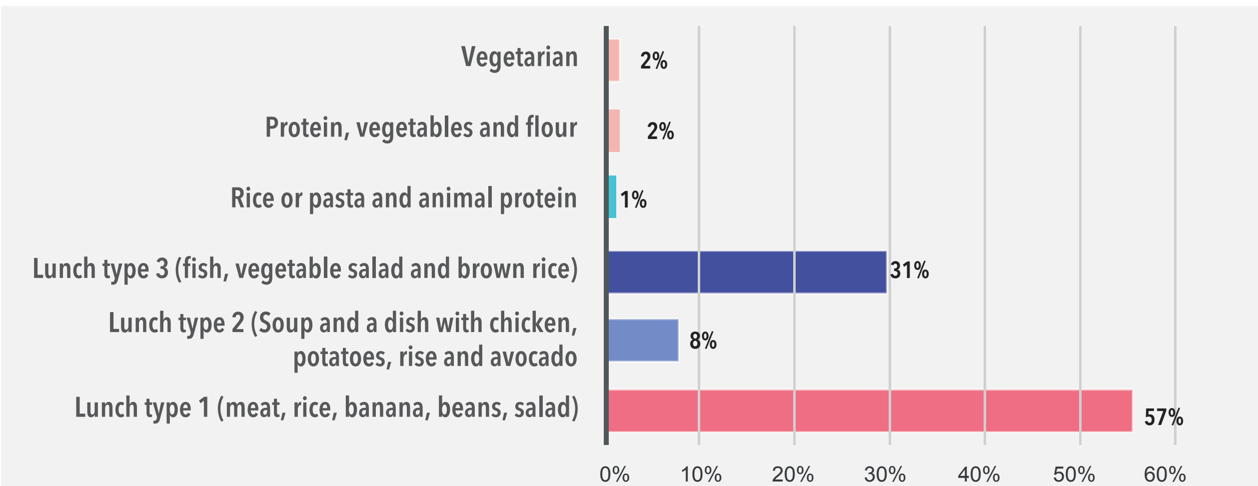
GRAPH 21. Food eaten frequently



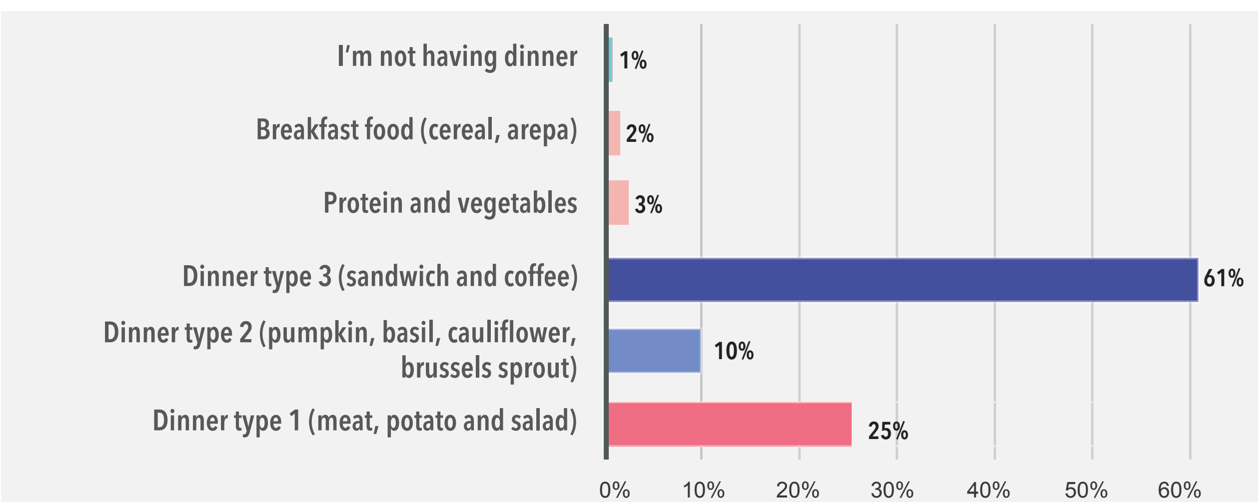
GRAPH 22. Food you feel best about at breakfast



GRAPH 23. Food you feel best about at lunch

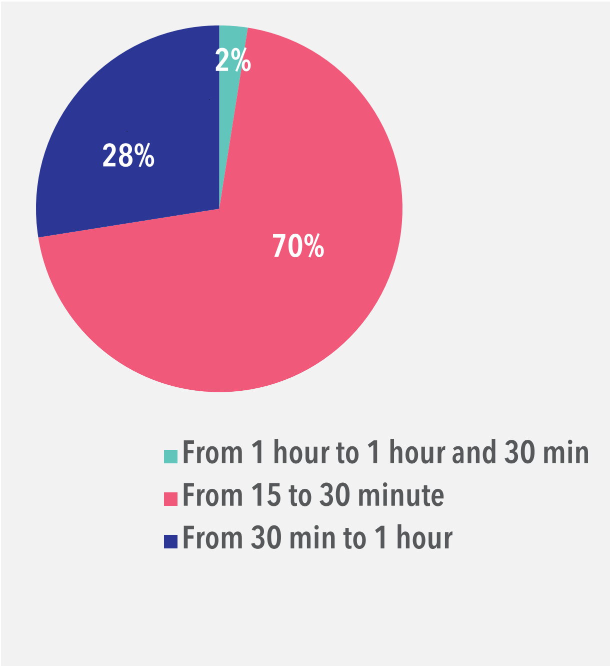


GRAPH 24. Food you feel best about at dinner



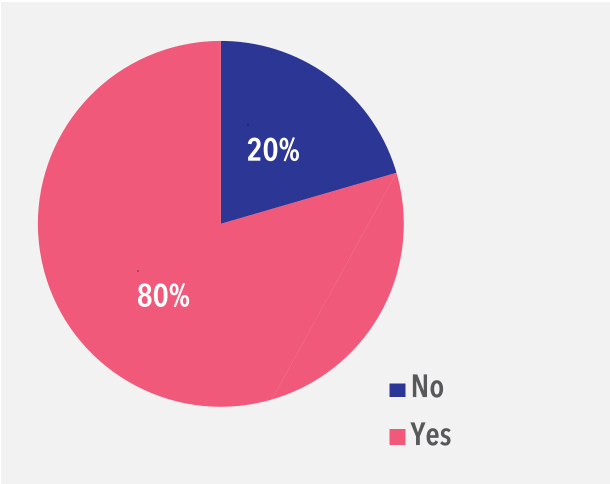
The 70 percent of young adults used to eat around 15 and 30 minutes. Usually students are running and don't dedicate enough time in their meals, instead workers have 30 minutes or more for their meals.

GRAPH 25. Estimated time spend eating



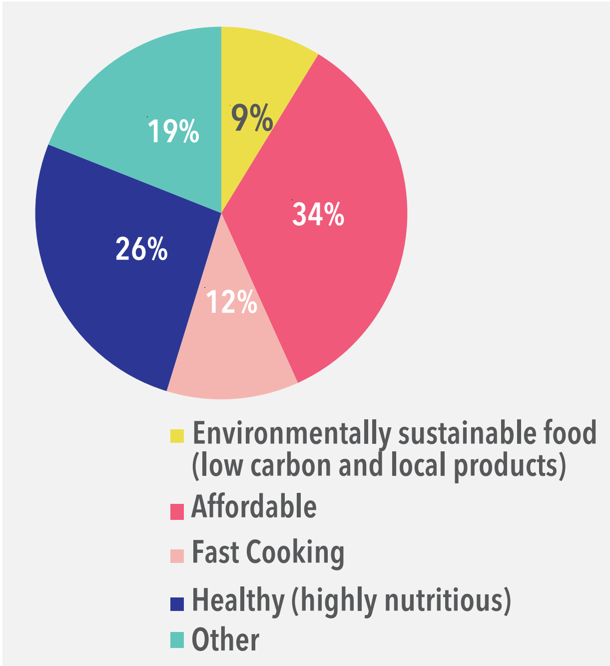
To understand if people in this age range are willing to have a change in their diet it is important to know if they have done it before, to that question 80 percent answered yes.

GRAPH 27. Shows if people have changed their diet by feeling that they weren't eating properly



The Colombians assure that when they go to buy their food their priorities are the price, affordable to their budget and healthy products.

GRAPH 26. Reasons why people choose their products



7.4 PROJECT REQUIREMENTS

The apps that are currently working, don't have the possibilities to work in different areas like the psychological, physical exercise, nutrition and neither has a specific doctor to help an overweight person. For the argument mentioned before, an interdisciplinary team will help to understand better the person and help him to drive his actions to achieve goals in short, middle and long time. The team will be selected and customized depending on the personality of each person, moreover, the professional group will have access of each area of a common report created. As the professionals said the period of the whole process should be at least four months, in which the patient will be losing weight in a healthy way, with the aim of create a long term habit.
The service will be focus on enhance the experience of a healthy life style in mental, nutrition and physical activities.

The system will work only for people with overweight and severe obesity, because when a person is suffering a morbid and a super obesity is recommended to go in a specialized clinic.

EXPERT	RECOMMENDATIONS	REQUIREMENTS	BEHAVIORAL CHANGE STRATEGIES
Nutritionist	1. Avoid consumption of packaged and sugary products. 2. No snacks . 3. Training on what to eat (balance meals) and on what portions in the three meals (use a 9-inch dish size). 4. The diet must be done regarding the preferences of each user. 5. Eat is a pleasure (don't focus on calories). 6. Don't do another activity while you are eating. 7. Change bad options for healthy and find out what your personal food trigger are (don't keep them at home). 8. Lose weight in a normal way (3 or 4 kg per month).	1. The system should teach its users to gradually reduce the consumption of sugary products. 2. Promote water consumption at times of eating snacks. 3 and 5. Use the hand food measurements method to train people on what portions they should eat. Ideas of food options regarding the typical food of the region. Examples of ingredients of a buy list for a week and recipes. Videos of explanation regarding how to choose the right products. 4. The nutritionist expert has to add in the diet food that users like. 6. Remember the user to enjoy his eating time and focus on it at least 15 minutes. 7. Give examples to replace bad options. 8. The expert should plan in a schedule how the user could lose weight.	1. Challenges each week to reduce the consumption of sugary products (Ex: first week just one candy instead of three each day, second week one candy on alternate days, three and four week one candy per week). If is register this information can win points. 2. Notifications to remember the consumption of water. 3 and 5. People can take a photo of their dish to know if they are doing right with a feedback of the app. They can win points, if they do it more than 5 times per week can receive a **special secret gift.** 4. The user has to feel involve during the creation of the meal plan. 6 and 7. Give some recommendations to enjoy the food and make the right choices. 8. Set weekly goals, if the user achieve them can win points and change to next levels. Promote also one cheat meal as a reward in the weekend if the person eat well during the week.

Physical trainer	1. Exercise at least 30 minutes a day or one hour three times per week. -Fist month: Conditioning of the body to gain muscle strength and avoid injuries (this month is crucial to create the habit). -Second month: Strengthening, resistance and flexibility are worked. -Third and four month: It's a phase where people go to do what they want, tone, increase muscle mass or if they want to lose weight. 2. It's important to know person's motivation and purpose (technique of 5 whys). 3. Help to choose a physical activity regarding the preferences of the user. 4. Know barriers of each person as the time. 5. Show how a wrong exercise is done and how well it is done. 6. Analysis which of the three body constitution the person is (Ectomorphic, mesomorphic or endomorphic). 7. Know how he did and how he feels after each session. 8. Give feedback based on his process. 9. Motivate person for their next session. 10. Know how the person is before starting his training.	1. Program of four months with different activities approach. 2. Possibility to create short and long-term goals. Find the real reason why the user want a change. 3. The system needs to offer different options of physical exercise. 4. To plan ahead exercise activities the app needs a schedule. Also a 24/7 chat must be available if the user has any doubts. 5. Videos that explain typically mistakes when someone is exercising and how to do it well. 6. In the expert area is required to add which body constitution the person is and in the gee user should be an explanation of advantages of each body. 7. The app should send messages asking how the person feels after each session and how did it. 8. The system should provide feedback on how was doing the person before and how is doing now. 9. Motivational quotes are required before a session that must be schedule. 10. The user can write if he wants, how is he feeling before a training session.	1. Challenge to complete 16 levels in four months, each week is one level and is required to obtain at least 2.000 points to advance to the next level. 2 and 4. Schedule a plan with short and long term goals, for each goal is required to set a score. For the achievement of goals is necessary plan when the person has free time to exercise. If the user has some doubts can ask on the gee chat. Use technique of 5 whys to find user's real motivation. 3. Possibility to select a physical activity depending on the user's preferences. 5. If the user see the videos of guidance can win points. 6. Show how person can take advantage of his body. 7. Signal notifications after a scheduled training has been completed. 8. Surprising feedback based on user's process. 9. To motivate people before a session scheduled, he could receive motivational quotes. 10. To keep on track the physical activity emotional process, the person can write how is feeling.

Psycholo-gist	11. For people with disorder, therapies should be once every 8 or 15 days. 12. It's important to know how the emotional state, sleep, feeding, and exercise habits are. 13. Work with self-schemas, with the goal of strengthening self-esteem. 14. Create two lists of things right and wrong the person sees in himself. 15. Ask a friend or someone close to you, what he sees positive in you. 16. Challenge yourself to belong in a new social group. 17. Write during the week things you want to tell. 18. Learning relaxation and breathing techniques, meditation also helps. 19. Learn to differences emotionally and physically hungry. 20. Reduce consumption of packaged products and sweets gradually. 21. When it is time to eat focus on doing this activity. 22. Control the speed you eat. 23. Learn how to read a label 24. Educate the user in how to change habits. 25. Know the real goal motivation of the person 26. The plan created should follow user's preferences.	11. The app must have appointments available every week. 12. Before the process start there should be a questionnaire asking about emotional state, sleep, feeding, and exercise habits are. 13. The system requires exercises to strengthen self-esteem. 14. Layout of a list to be completed with positive and negative thoughts. 15. Possibility to send links that can be filled by a friend. 16. Every week the app must challenge its users with activities. 17. The app requires to have a journal if the person wants to write. 18. There should be content of relaxation and breathing techniques, also meditation topics. 19, 21 and 22. It's necessary a section with tips on good habits and benefits of lose weight. 20. The system should teach its users to gradually reduce the consumption of sugary products. 24. Explanation videos regarding how to read a label. 25. Possibility to create short and long-term goals. Find the real reason why the user want a change. 26. The recommendation plan must have things user like.	11. Each time a user schedule an appointment win points. 12. When the user answers a questionnaire win points. 13. Every time is completed an exercise of self-esteem exist the possibility to win points. 14. Each list can be save to see the progress of thoughts, can gain points if the list is completed. 15. The user can send gee links to his close friends and see what they think about him. 16. If the person do a challenge can have bonus points. 17. Some notifications can appear during the week to remember the user to write something he wants to talk with his psychologist. 18. Notifications to remember the user practise relax techniques at least 10 minutes. 19,21 and 22. Explain in a simple way how is possible to change good habits. 20. Challenges each week to reduce the consumption of sugary products (Ex: first week just one candy instead of three each day, second week one candy on alternate days, three and four week one candy per week). If is register this information can win points. 24. Short videos of explanation. 25. Use technique of 5 whys to find user's real motivation. 26. The plan guide is more attractive and easier to reach with activities and foods that the person likes

Doctor	27. Drink water to feel satiated when it's time for meals and after it don't consume so much. 28. Do more physical activities in daily routine. 29. Regular exercise during the week and weekend. 30. It's important to know the basal metabolic rate of each patient to know on average the quantities of calories he requires to consume each day (this also depend of his physical activity). 31. Focus the diet in calories isn't necessary, the person needs to control portions and intake products with good quality calories (some food has the same calories but its quality is different). 32. Overweight people need to be aware and know other diseases that can be caused by their weight. 33. To help people to achieve their losing weight goals, they should do medical exams as: CBC test, glycemia pre and pos, complete lipid profile (triglycerides, cholesterol, HDL and LDL), kidney function tests (creatinine and partial urine) and electrocardiogram .	27. The system should remember users to drink water before meals at least one glass of it. 28. The app can give some advice to users like climbing stairs instead of using the elevator, walking a small distance instead of using the car or before getting up completely made a small routine of stretching, among others. 29. Show different kind of techniques to exercise, for example: Zumba, pilates, aeroyoga, running, yoga, crossfit, kickboxing/MMA, aerobics, triometrics, isometrics, body systems, insanity, swimming, HIIT, functional training, Pole Dancing, TRX, Hip Hop Fitness, Barre, outdoor training, home gym or the reliable gym. 30. The app has to calculate the basal metabolic rate before giving any advise in food intake. 31. Good quality of calories is a topic that requires to be explain, but is extremely important teach control the portions (hand food measurements). 32. The system should inform about the diseases caused by been overweight. 33. The app needs to have a section to upload exams.	27. Can be used signal triggers like a light effect to remember to the user drink water. 28. In the section of tips area can appear the physical activities improve advice with graphic simple examples. 29. To help the user select his ideal exercise and stimulate to practise it, he can use gee discounts to join new activities with our partners. 30. When users fill the questionnaire of weight, height and physical activity to calculate the basal metabolic rate, they win points. 31. People can take a photo of their dish to know if they are doing right with a feedback of the app. They can win points, if they do it more than 5 times per week can receive a **special secret gift**. 32. Explain in an simple an interactive way what diseases are also associated with overweight. 33. Every time a user upload an exam can win points.

CAMILA RODRIGUEZ

AGE: 25 years
LIVES IN: Bogota
MARITAL STATUS: Single
EDUCATION: Veterinary medicine
OCCUPATION: Intern as a veterinarian doctor
HOUSEHOLD INCOME: 500 €

SOCIAL MEDIA

DEVICES OWNED

GOALS

- Feel relax and support with her choices
- Take care of herself and enhance her health
- Get the right information based on her needs

FRUSTRATIONS

- Information overload. There are millions of diets, which one is the best for me?
- Can't achieve my goal of being healthier as in the past
- Lose my motivation, don't receive feedbacks

MOTIVATORS

Save money

Save time

Confidence

Gamming knowledge

Social support

Feeling organized

Camila likes dance, animals and nature. She has been working in a veterinary clinic in the past six months. She really like the technology, usually she does everything with her phone, even when she eats used it to avoid be alone or be bored. Camila has low self-steem but has good friends and is always looking for new experiences to do with them. She lives with her mother, but they don't spend too much together because both works the whole day and just have time to share late at night when have a "light" dinner together (a sandwich with a coffee).
In her daily life Camila doesn't exercise and cooks at home only her breakfast and dinner, but for lunch she is used to eat outside. Her currently diet is carbohydrate-based with poor quantities of vegetables, this diet is the most consumed by Colombians. When she goes to the market to buy food, she looks for products affordable to her budget.
Recently she did a blood test and her cholesterol was high, her doctor recommend her to change her habits but, in the past, she tried it and didn't work. Right now, she is seeking for a service that help her to improve her currently eating, exercise and mental habits.

"I'm trying to enhance my health in an innovative way without overload information"

7.6 JOURNEY MAP OF A NORMAL DAY IN CAMILA'S LIFE

SCENARIO

It will be given a description of a daily routine of Camila's home and work.

GOALS AND EXPECTATIONS

Camila hopes to fulfill her commitments in such areas as stiching her schedule and performance at , without neglecting her family and friends.

MORNING

1. 6:10 a.m.
   She wakes up after six hours of sleep.
2. 6:20 a.m. - 6:27 a.m.
   She takes breakfast with an egg, chocolate, cheese, bread, a fruit and orange juice.
3. 6:30 am - 6:38 am
   She bathes.
4. 6:40 a.m. - 6:50 a.m.
   She gets dressed, fixes herself, and sets up her purse.
5. 6:51 a.m. - 7:00 a.m.
   She leaves home and walks to the bus stop.
6. 7:03 a.m. - 7:05 a.m.
   She takes the bus and sits on a 50 min tour.
7. 7:50 a.m. - 7:58 a.m.
   She arrives at the bus stop in her office and walk to the vet.
8. 8:00 a.m. - 10:25 a.m.
   Begins her working day, where she spends 2 hours sitting down.
9. 10:30 a.m. - 10:45 a.m.
   Has a snack of empanada and soda.
10. 10: 48 a.m. - 12:25 p.m.
    Work 2 more hours and spend 1 hour and 30 min sitting down.

AFTERNOON

11. 12:30 p.m. - 12:50 p.m.
    She goes to a restaurant and eats a protein for lunch, three carbs, salad and sugar juice.
12. 12: 53 p.m. - 1:15 p.m.
    She goes to a street store, buys a dessert and is taken 10 min before starting her journey labor.
13. 1: 20 p.m. - 1:30 p.m.
    She bathes her teeth and mends herself again.
14. 1:35 p.m. - 3:30 p.m.
    Starts her journey work and spend 1 hour and 30 min sitting down.
15. 3:35 p.m. - 3:50 p.m.
    Has a snack of cookies and a yougurt.
16. 3:55 p.m. - 5:00 p.m.
    She works another hour sitting down.
17. 5:05 p.m. - 5:20 p.m.
    She comes out of the vet's office, walks to the bus and wait standing 15 min.
18. 5:25 p.m. - 6:20 p.m.
    She arrives at the bus stop near her home, then is 50-minute sit-down where she hears music, chats and watchs series or videos.
19. 6:30 p.m. - 6:45 p.m.
    Has another fruit snack with packages.

NIGHT

20. 6:50 p.m. - 7:10 p.m.
    She cooks the food for her mom and her, that is a sandwich and a cup of coffee.
21. 7:13 p.m. - 7:30 p.m.
    She takes her cell phone and does various activities while waiting for her mother's arrival.
22. 7:35 p.m. - 8:00 p.m.
    She sits in the dining room next to her mother both eat and talk about what happened during the day.
23. 8:05 p.m. - 10:00 p.m.
    She watchs TV alone in her room, while is interacting with her Cell phone lying on her bed.
24. 10:05 p.m. - 10:15 p.m.
    Write a daily post on her socail media, describing what happened to her.
25. 10:20 p.m. - 11:30 p.m.
    She talks by chating or calling her friends.
26. 11:50 p.m. - 12:00 p.m.
    She brushes her teeth, puts on pyjama and lies down to sleep.

OPPORTUNITIES

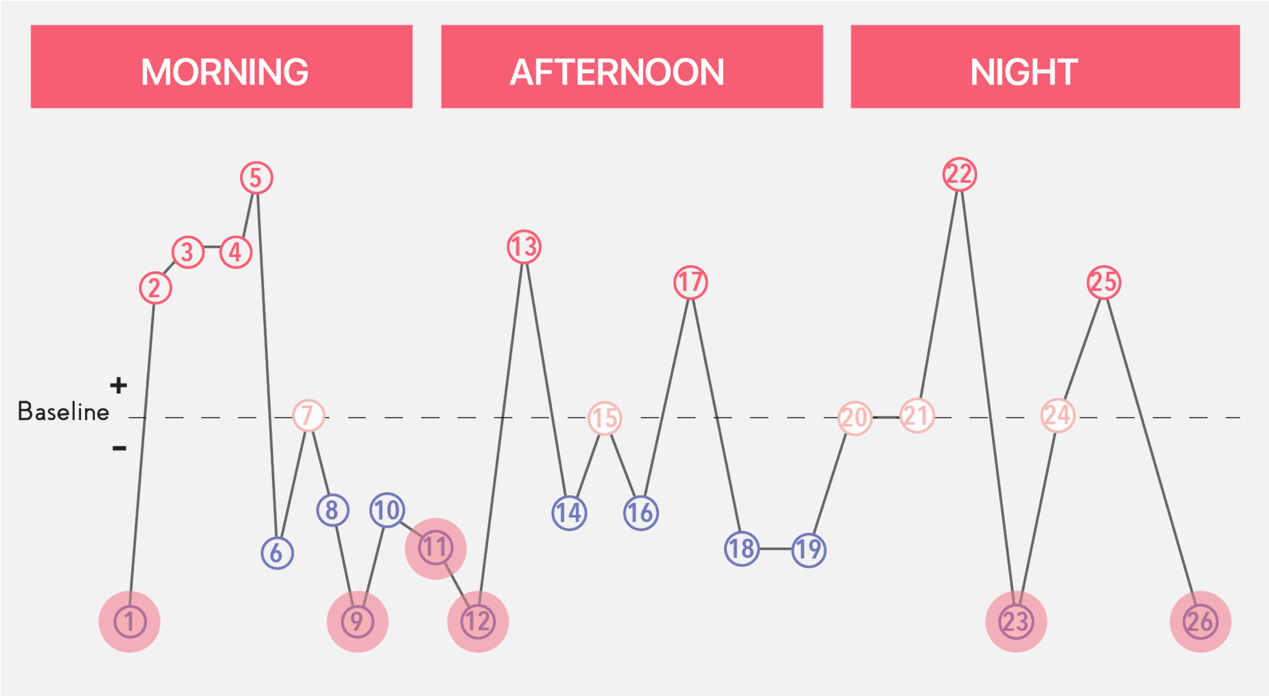
She can get up early to do some self-esteem exercises, change the type of snack she takes, try to drink water, and take active breaks during her working day.

OPPORTUNITIES

She should decrease the sugar and carbohydrates she consumes at her lunch and snacks. She needs to enhance more movements during the day.

OPPORTUNITIES

She can include in her dinner salad and make better use of the time at night, she could join a dancing class to avoid a sedentary lifestyle. To have more energy for her routine, she must go to bed earlier.



7.7 CONCEPT

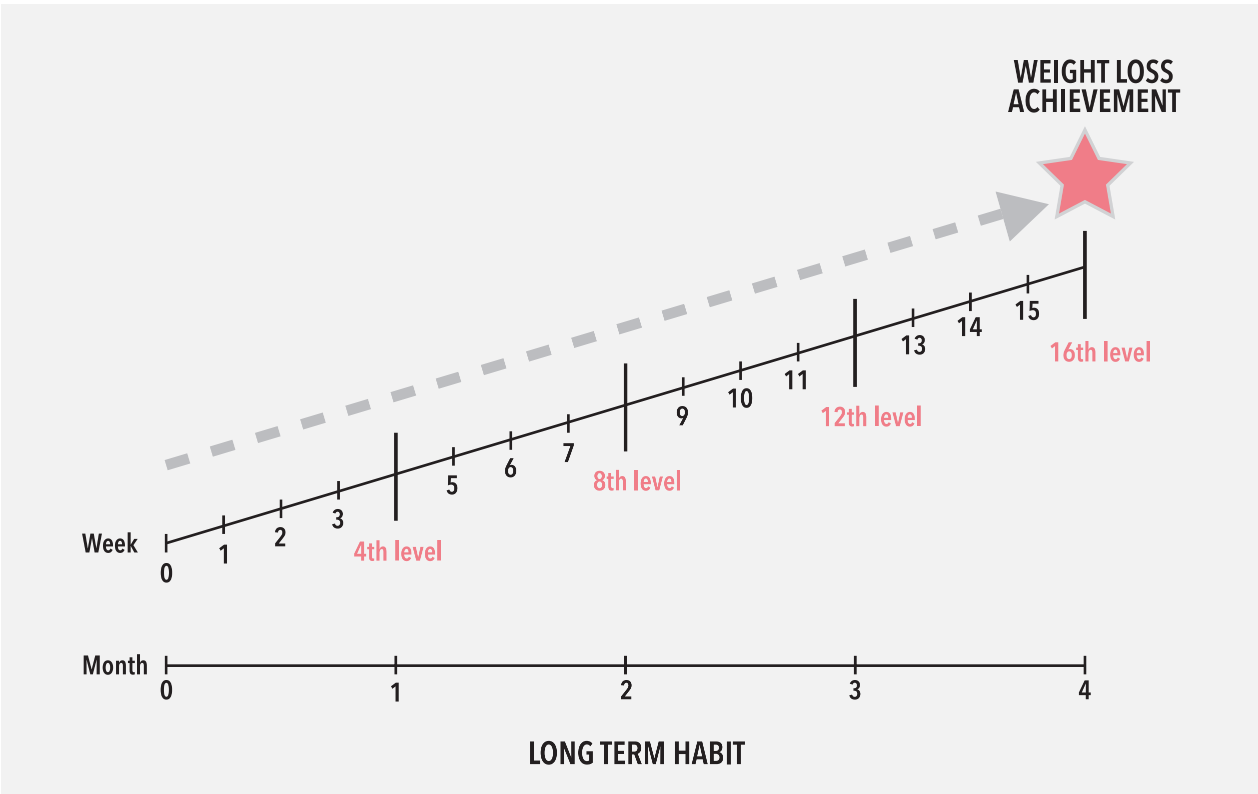
Interactive and digital mobile application with personalized content that allows to **connect a multidisciplinary overweight expert team** as psychologist, nutritionist, physical trainer and doctor with a **person who wants to improve his physical and emotional state**, encouraging behavioral change through **social status, points and discounts incentives.**

7.8 STRATEGY OF LOSING WEIGHT IN A HEALTHY WAY CHALLENGE

The next points explain how the strategy of motivators rewards will work in the app:

- 16 levels in 4 months, it means at least 32.000 points but with extra activities the user can win more points and discounts.
- Each week is one level.
- It's possible in one week to win 2.000 gee points, and this quantity is the necessary required to beat a level.
- The goal is to lose 3 or 4 Kg per month, but with the aim of creating a long-term habit.

FIGURE 19. Strategy of weight loss in four months of gee app.



7.8.1 EXPLANATION OF POINTS, GIFTS AND DISCOUNTS.

ACTIVITY	SCORE
First schedule appointment	400 gee points
Schedule an appointment	200 gee points
Answer a questionnaire	250 gee points
Register information regarding the reduction of sugary consumption	150 gee points
Take photo of a dish	300 gee points
Take more than five times the photo of a dish	Special surprise gift
Set weekly goals, if the person achieve it can win extra points	250 gee points

Set monthly goals, if the person achieve it can win extra points	1.000 gee points
Set a 4 month goal, if the person achieve it can win extra points	5.000 gee points
Plan ahead time for exercise each week	250 gee points
Complete an exercise of self-esteem	150 gee points
Meet a weekly challenge	400 gee points
Fill a list of positive and negative thoughts	150 gee points
Write down your real motivation	300 gee points
See videos of exercise guidance explanation	100 gee points
See videos of how to read a label and topics regarding the quality of calories.	100 gee points
Join a new activity of our partners	20% Discount
Upload exams in the app	500 gee points

7.9 GEE! APP

Gee is a mild expression, typically of surprise, enthusiasm, or sympathy.

Gee app, is the practical result of the previous research and its focus to help overweight people by changing their behavior in a virtuous way. The core of the app is regarding the multidisciplinary team behind, there are nutritionist, physical trainers, psychologist and doctors improving the health system treatment of each patient with the aim of changing current behaviors and creating long term habits to enhance their well-being.
Gee counts with two profiles, the first one is for users who want to challenge their health and see effective results at least in four months; the second profile is for an expert team, who can see the progress and share specific information of each patient with other professionals.
To change behaviors and boost the user experience, the app has a community, which supports every user in his path, also exists the challenge of completing 16 levels in 4 months with a specific goal to receive points, gifts and discounts to make the process easier and receiving constant feedback of user's actions.

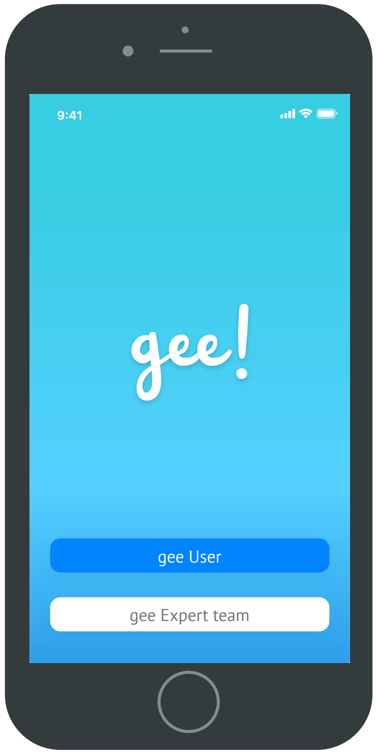
7.10 WIREFRAMES

7.10.1 GEE USER EXPERINCE WIREFRAMES

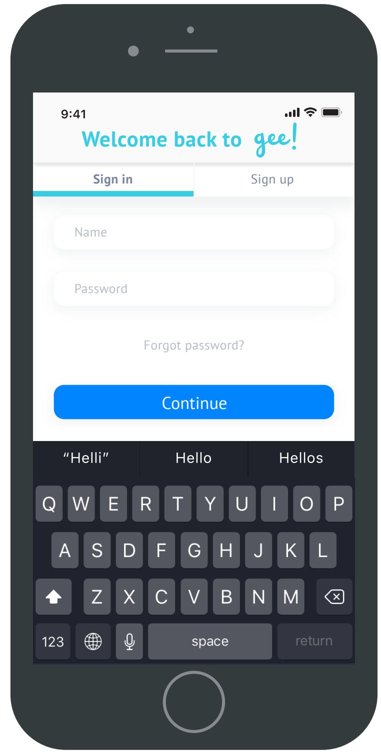
The next wireframes show the path of a gee user using for the first time the app, in this case is Camila, the persona selected who interacts in the app.

Most of the frameworks created were selected from opportunities found on the journey map of a normal day in Camila's life. The aim is to help her to start her process of having a healthier life, losing weight and increasing her self-esteem.

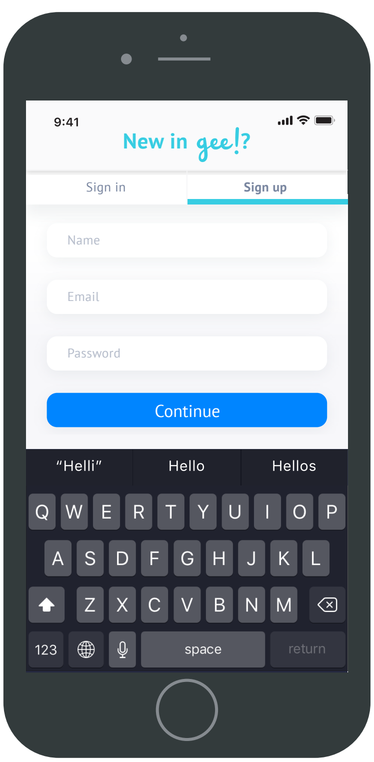
Wireframe 1. gee! Front cover.



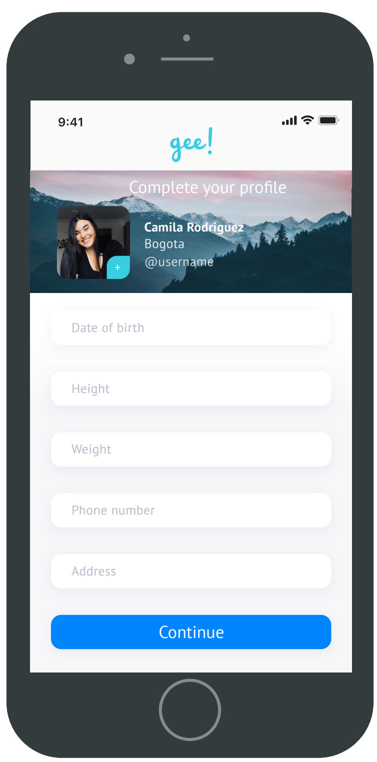
Wireframe 2. Sign in.



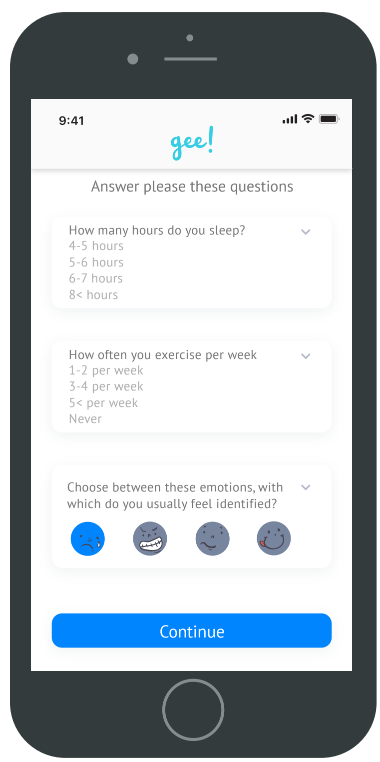
Wireframe 3. Sign up.



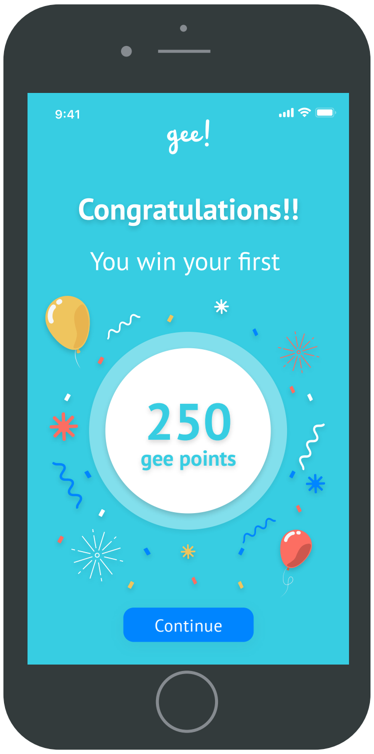
Wireframe 4. Configuration profile.



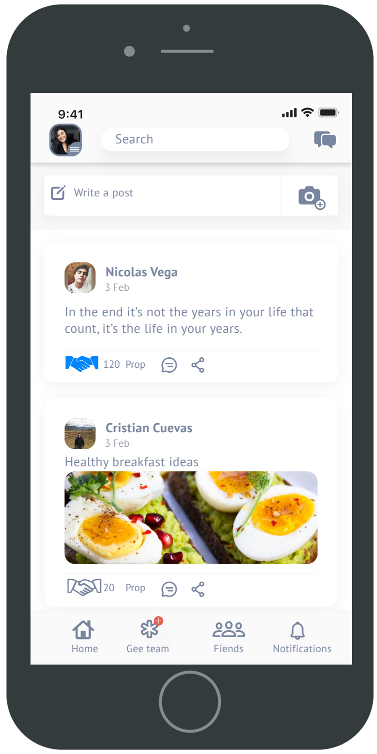
Wireframe 5. Questionnarie.



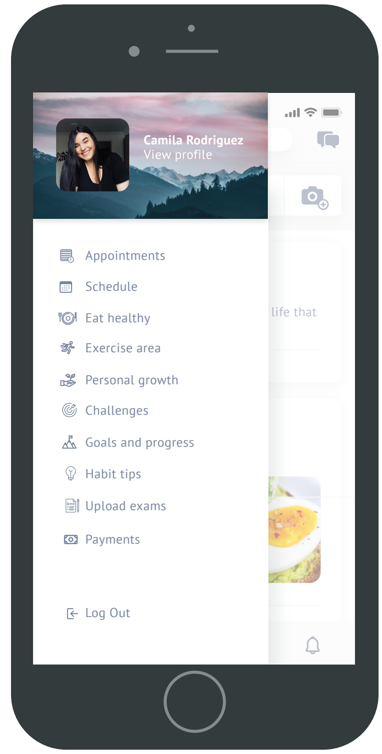
Wireframe 6. Reward points for answering questionnaire.



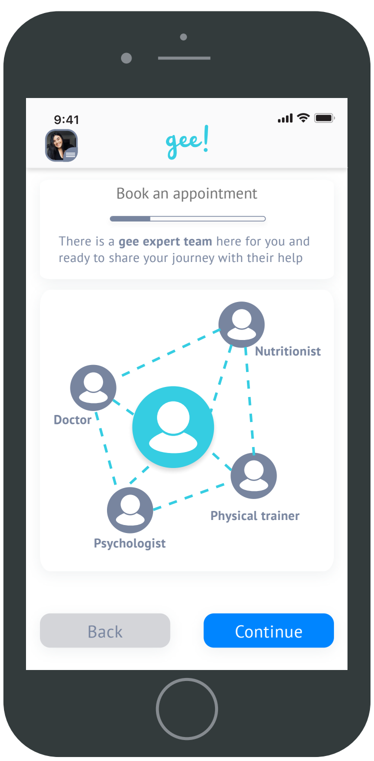
Wireframe 7. Gee social network and support of the community.



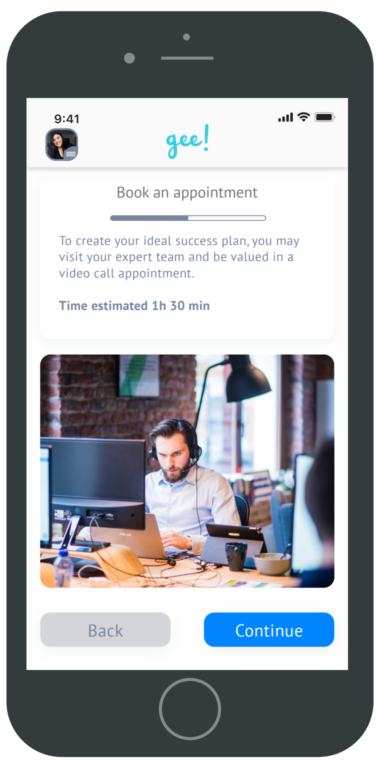
Wireframe 8. Left menu and the path for schedule an appointment



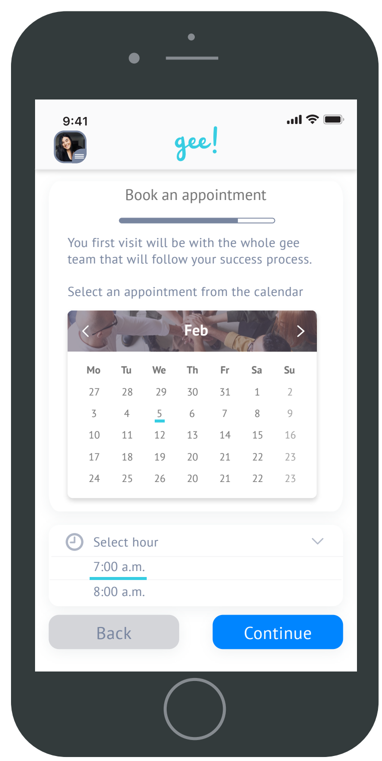
Wireframe 9. First step for booking an appointment.



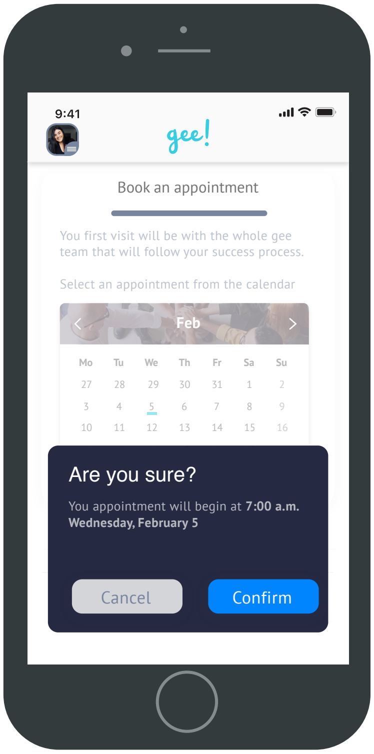
Wireframe 10. Second step for booking an appointment.



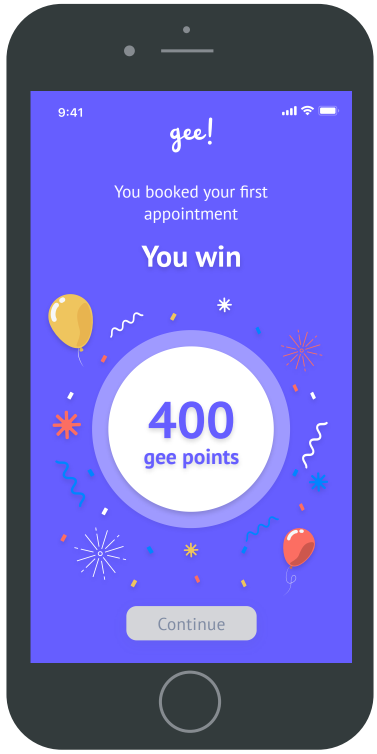
Wireframe 11. Third step for booking an appointment.



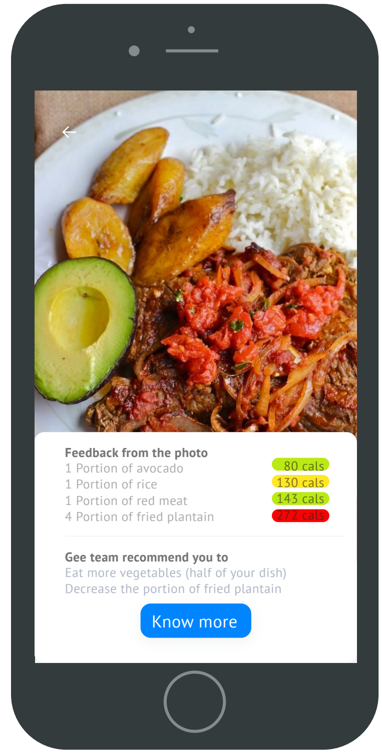
Wireframe 12. Confirmation of the appointment.



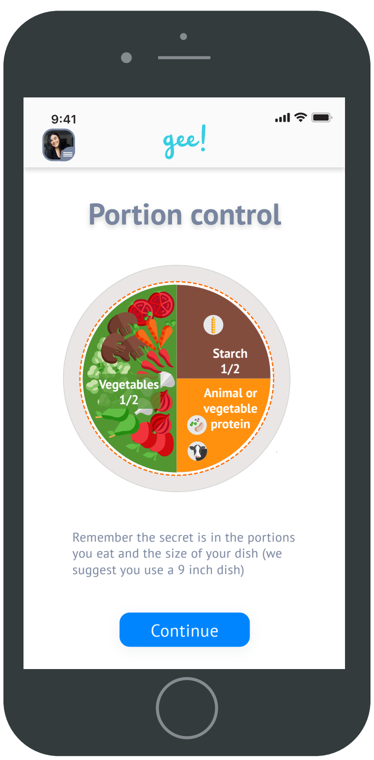
Wireframe 13. Reward points for booking an appointment.



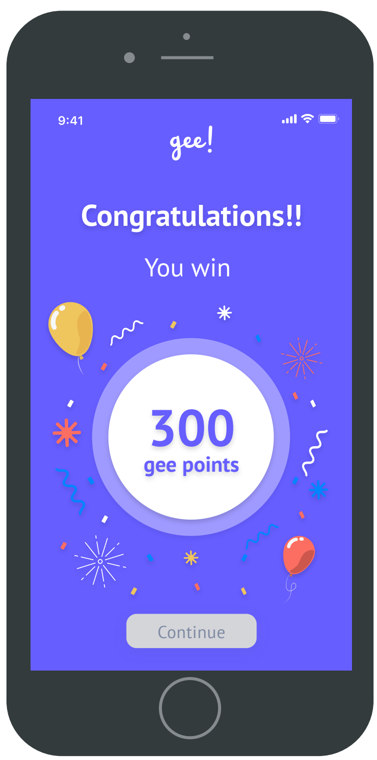
Wireframe 14. Analysis of the photo made by the user. The feedback uses colors of the semaphore to teach the quality of calories intake.



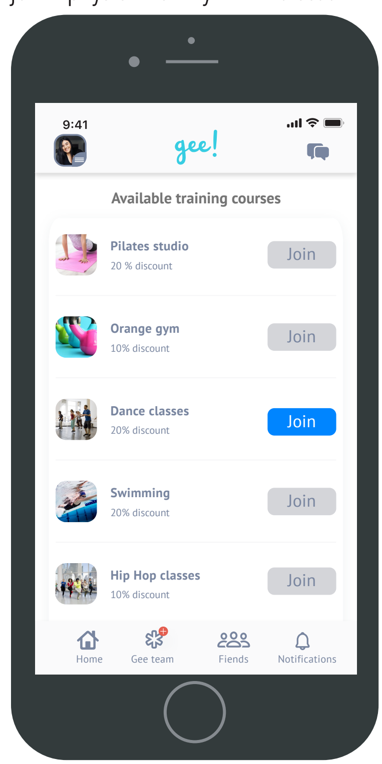
Wireframe 15. Explication of the control portion size.



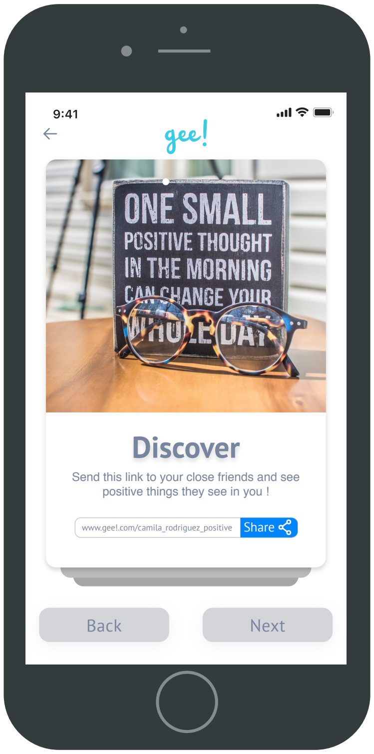
Wireframe 16. Reward points for registering a meal consumed.



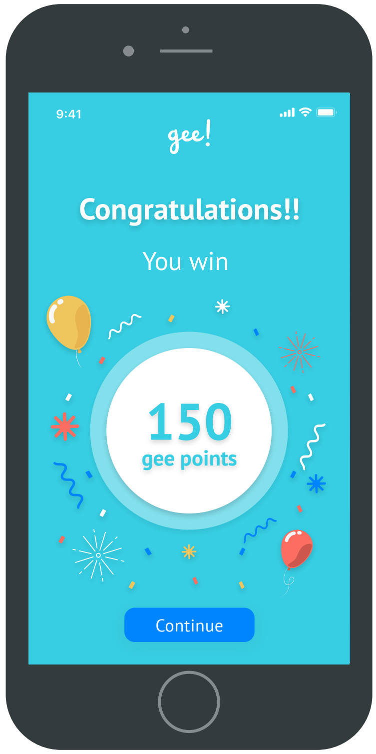
Wireframe 17. In the exercise area, to support Camila's preferences, she can join a physical activity with a discount.



Wireframe 18. This is an example of an exercise for enhancing self esteem in the personal growth area.

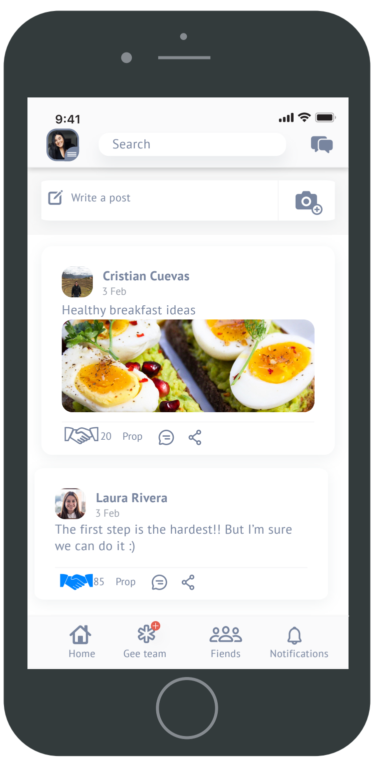


Wireframe 19. Reward points for completing an exercise of the personal growth area.

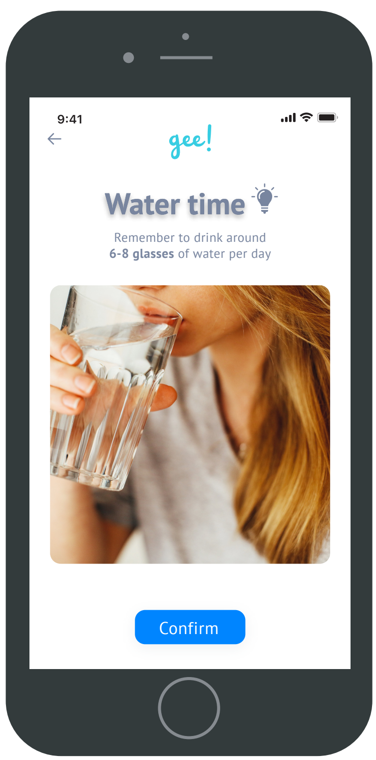


Wireframe 20. Example of a daily gee challenge to reduce the candy consumption.

Wireframe 21. Gee social network, possibility to share information and prop other users.



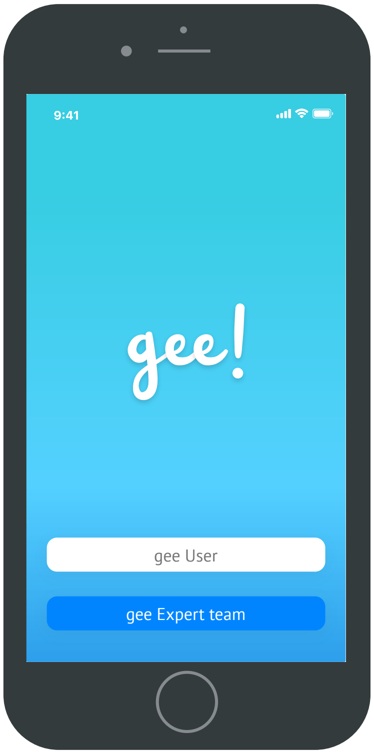
Wireframe 22. Reminder to drink water.



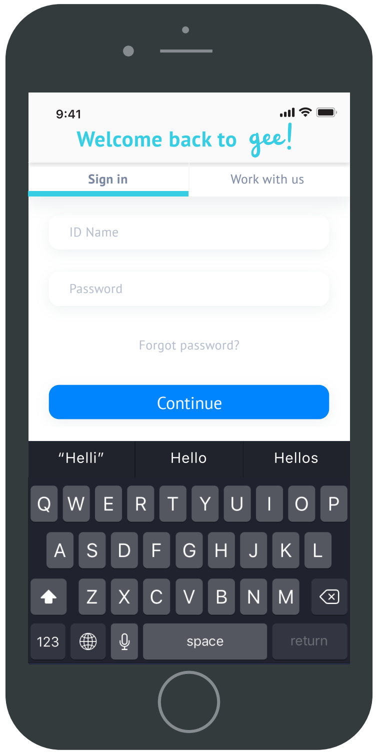
Wireframe 23. Feedback of the current sleeping hours habit.

7.10.2 GEE EXPERT TEAM EXPERINCE WIREFRAMES

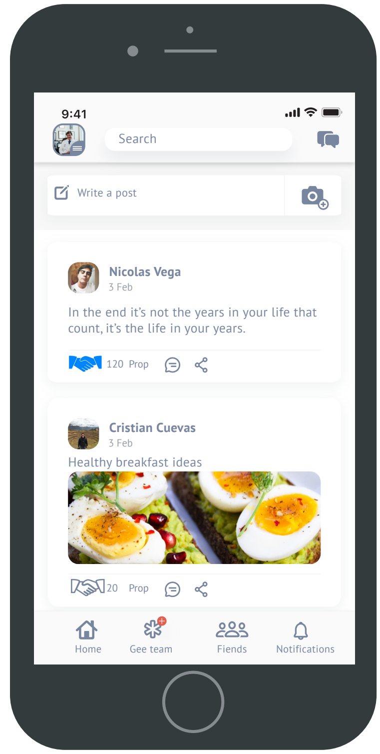
Wireframe 24. gee Expert team Front cover.



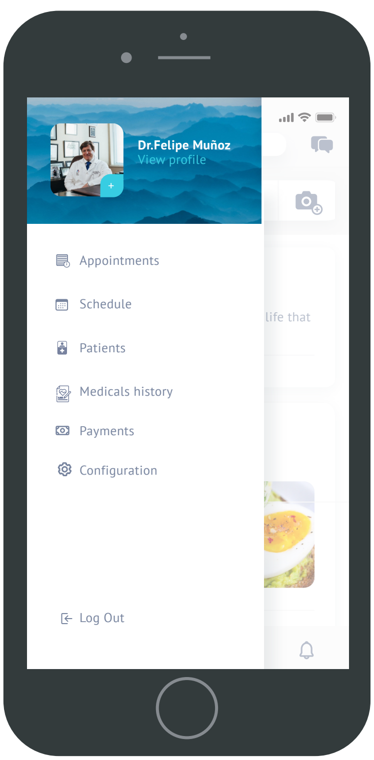
Wireframe 25. Sign in with an ID name.



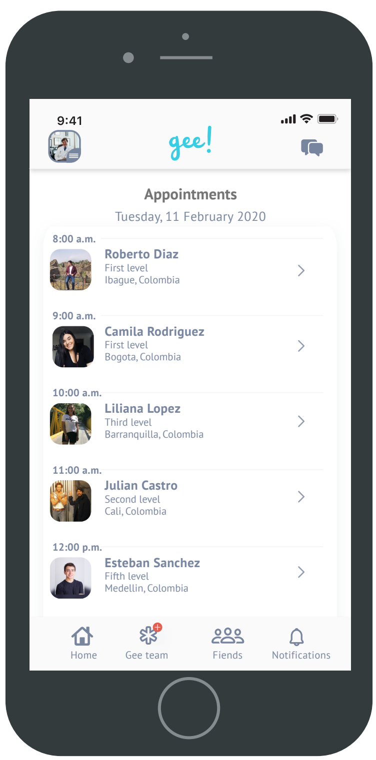
Wireframe 26. Access to gee social network and support of the community.



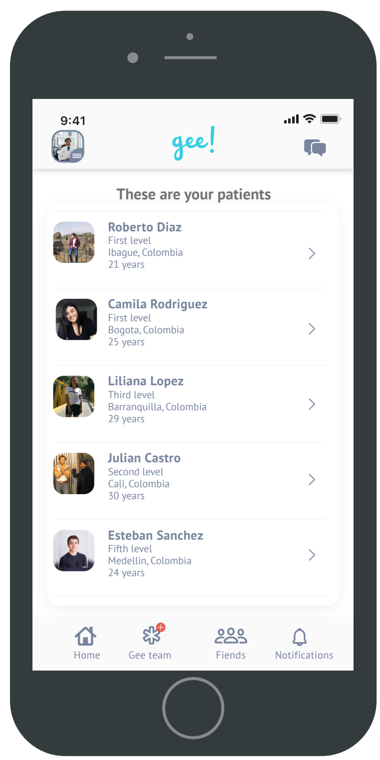
Wireframe 27. Expert left menu.



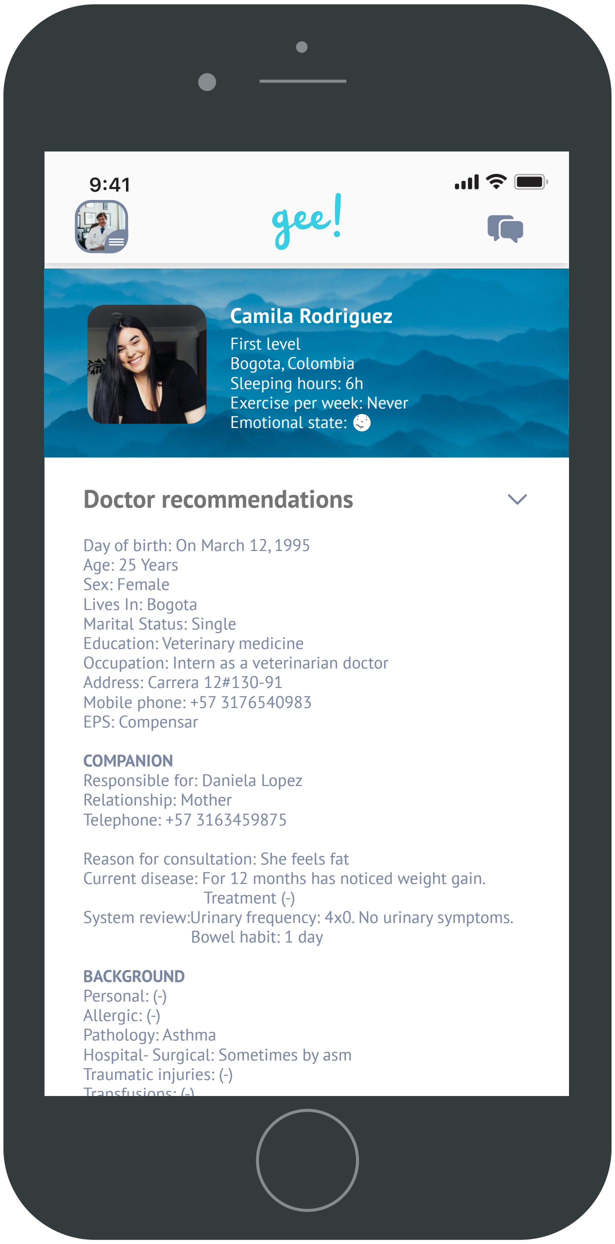
Wireframe 28. Possibility to see his patients appointments.



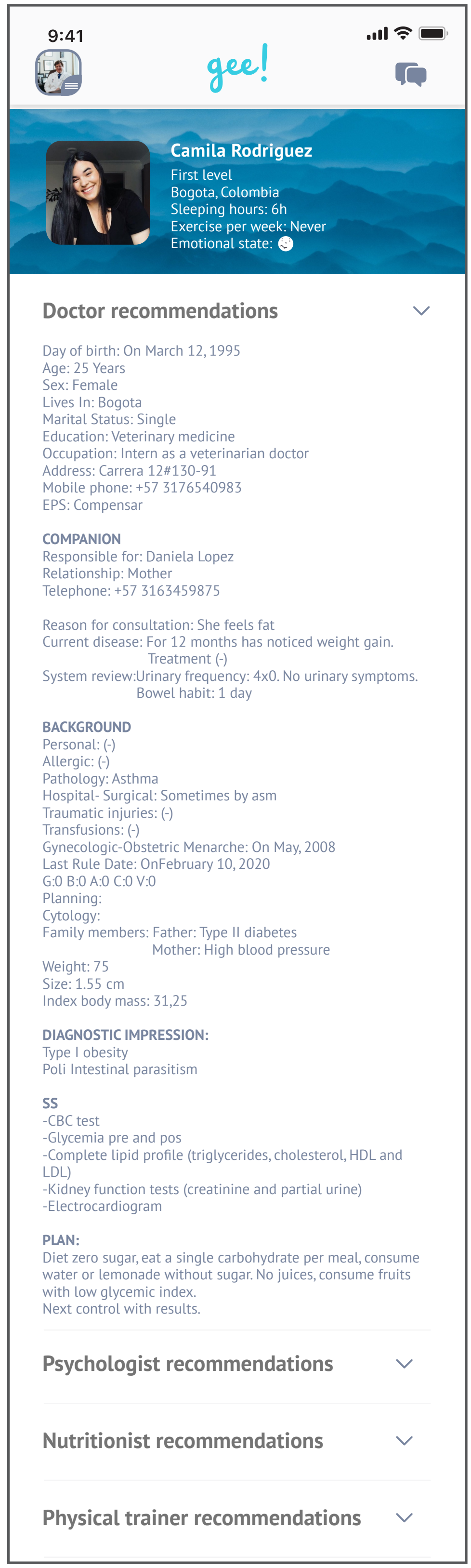
Wireframe 29. Possibility to see the profile of his patients.



Wireframe 30. Report of Camila's medical history with recommendations.



Wireframe 31. Zoom of Camila's medical history, also possibility to see at the bottom of the sheet the progress and recommendations given by other experts areas.



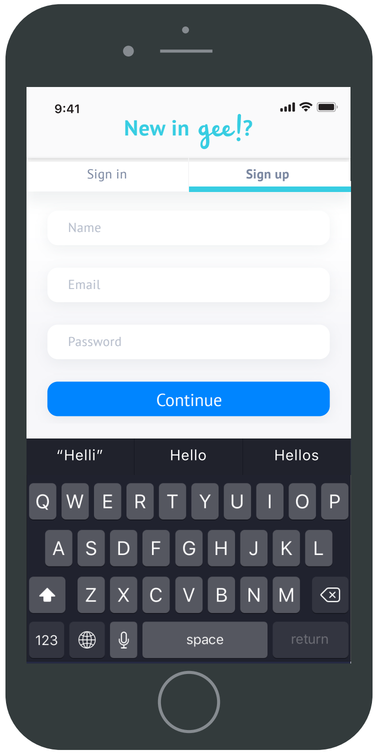
7.11 EXPERTS RECOMMENDATIONS EVALUATION

EXPERT	RECOMMENDATIONS TO IMPROVE THE APP
Nutritionist	Evaluate how the portion of food is measured. Explain the goal of earning points in the application, because the user doesn't know it. Can he use those points to have some benefits? The water reminder is a good idea. In addition to studying the nutritional part of a person, one important factor to study could be the amount of sleep that the person has and relate it to his mood to have another population study. It's very effective the part of the report of the interdisciplinary group to know the observations of other experts, to create a complete treatment and to give better solutions taking into account factors like pathologies of the person, psychological state, physical activity and eating habits.
Physical trainer	It's a complete, interactive and fun system. Before starting the treatment you could add the part that each person identifies with a body type, if it's ectomorph is very skinny, if it's mesomorph is in the middle and if it's endomorph is a chubby person. In the portion size of the food to reinforce the part of the feedback, explain the hand food measurements through drawings, one fits is the size for carbohydrate, protein is an open hand and two open hands for vegetables.
Psychologist	It's a complete application because it has everything related to treating overweight, there is the part of feeding, sleep, mood and also offers the accompaniment of all professionals. When people take a photo of the dish it's interesting because you can educate with your own food but it's important not to focus on calories, the idea of colors is great but you need to tell them about the portion, quantity and frequency because sometimes they eat something healthy but it's a lot. To teach and explain to them the size of the portions, they can use their own hand to measure (they can be guided visually by examples). When only the calorie portion is evaluated, people panic about the values. Specify what the points that users earn are for.
Doctor	Explain the meaning of calorie colors, because it creates confusion. Specify the information of the benefits the person has with the points (discounts on physical activities, restaurants, supermarkets). In the part of physical activity assess how the person can be helped to progressively exercise more. First week starts with physical activity of 3 days of 15 minutes, second week 30 minutes and so on until they complete an hour. Give daily examples of how the person can be more active (climbing the stairs instead of taking the elevator). In the food dish feedback photo teach people how they can measure their meals with their hands, also reminding them that portions vary by sex (men should eat larger portions than women).

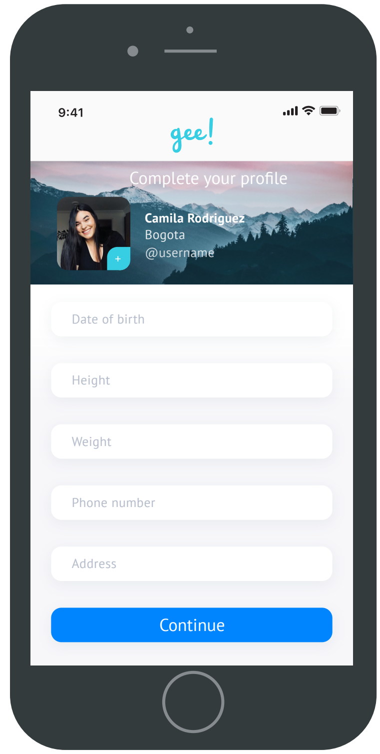
7.12 REFINE DESIGN

In the evaluation of the app made from the experts, they said that is really important explain what the goal is of earning points and the challenge before starting the whole experience through the app, because the users' can be awareness of which are the benefits of interaction. Wireframes 32 to 36 show the refine first experience in gee app.

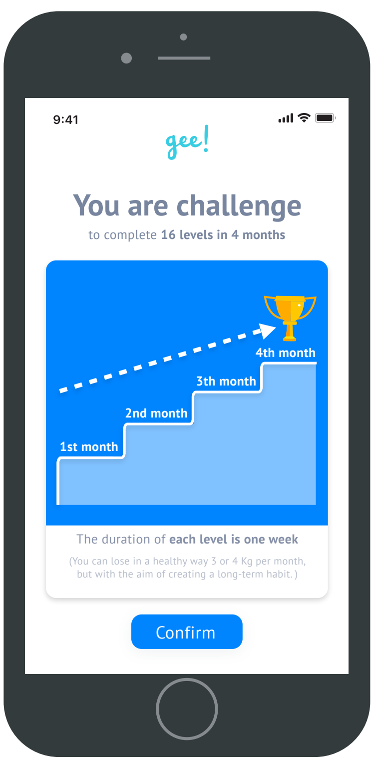
Wireframe 32. Sign up.



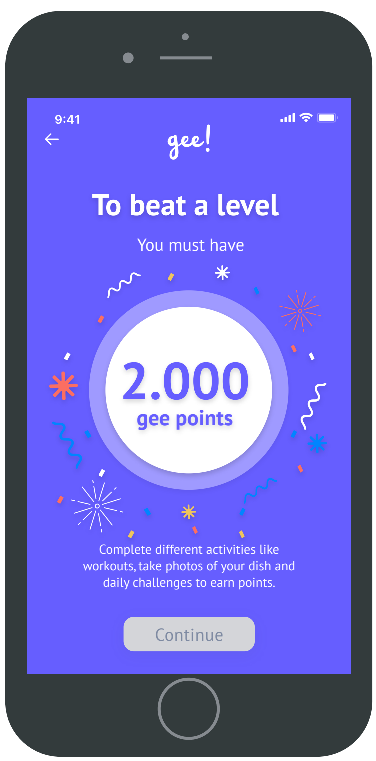
Wireframe 33. Configuration profile.



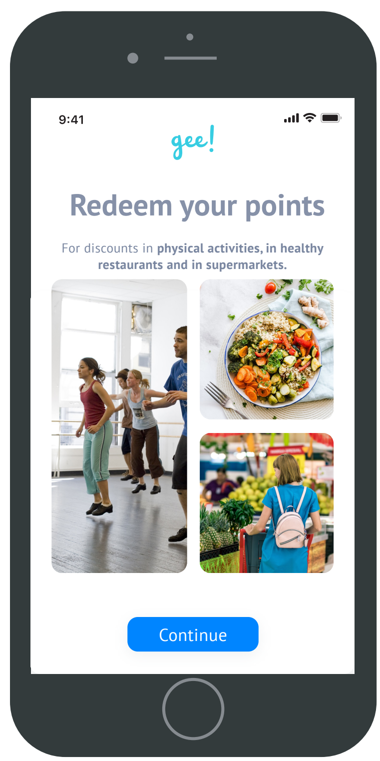
Wireframe 34. Challenge explanation.



Wireframe 35. Beat a level.

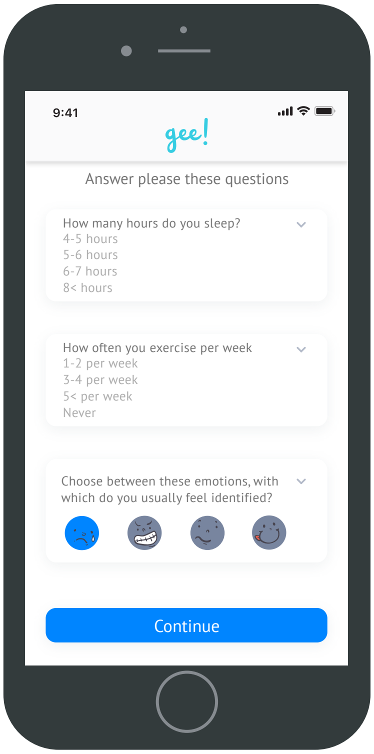


Wireframe 36. Redeem points.

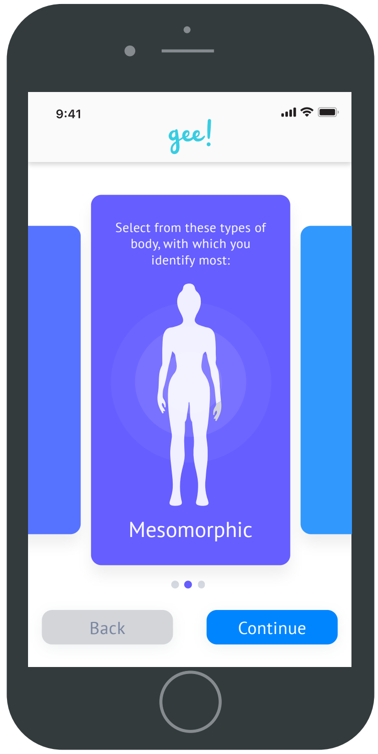


Another recommendation given by the experts was to complete the profile information adding different types of bodies, wireframes 37,38 and 39 evidence the changes made.

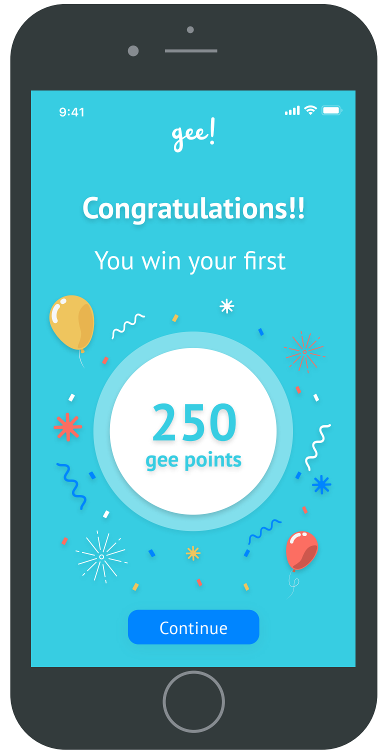
Wireframe 37. Questionnaire.



Wireframe 38. Type od body.

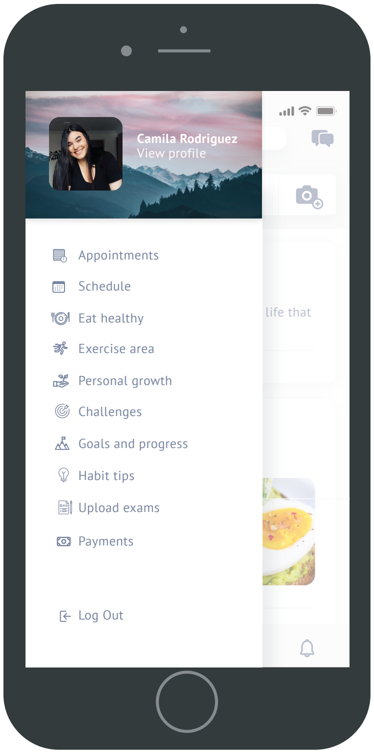


Wireframe 39. First points.

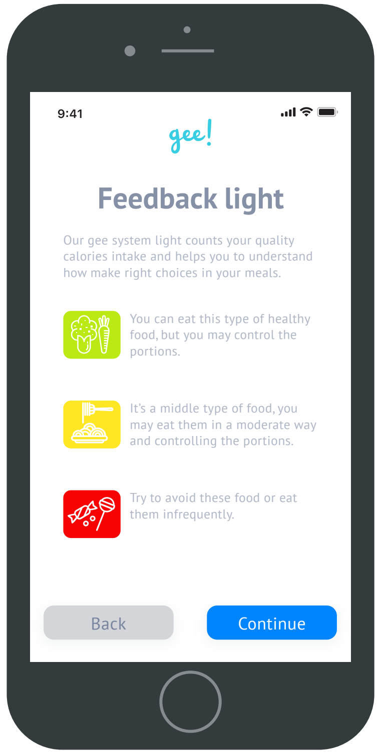


In the eat healthy area was required to explain better the feedback light of the quality of calories and focus in other aspects as the handy guide portion with visual examples. Wireframes 40 to 45 explicate how is the feedback process to help gee users make better choices when they are eating.

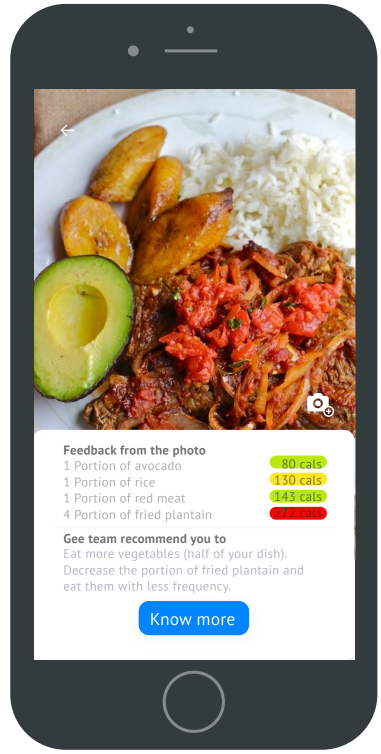
Wireframe 40. Lateral gee user's menu.



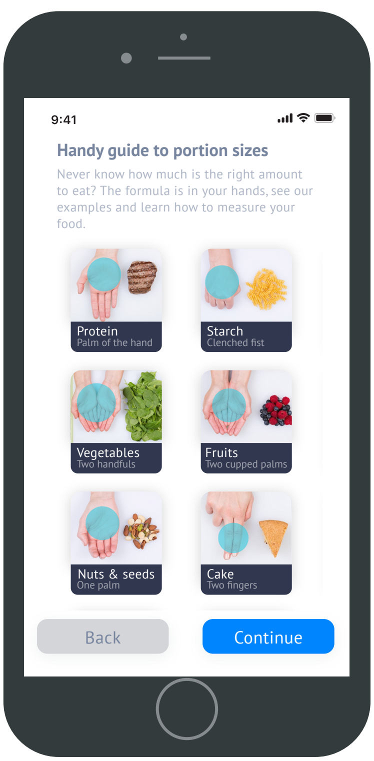
Wireframe 41. System light.



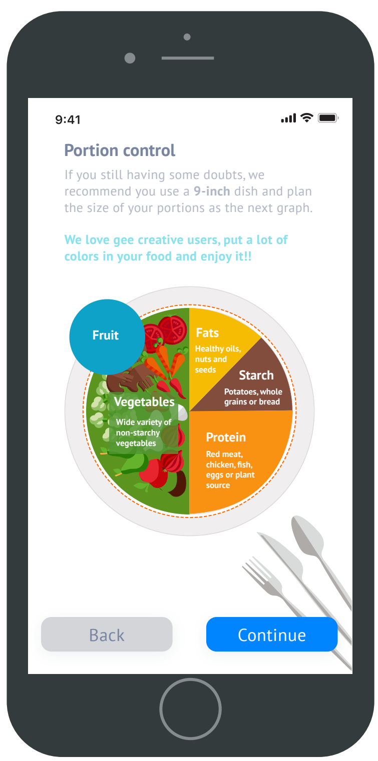
Wireframe 42. Feedback from the photo.



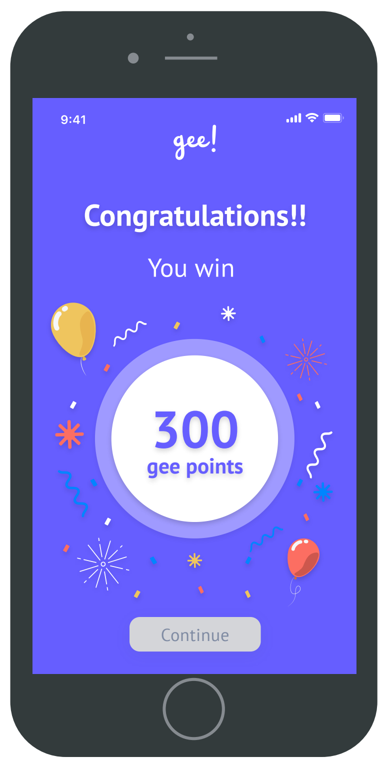
Wireframe 43. Handy guide.



Wireframe 44. Portion control.



Wireframe 45. Photo points.



8. CONCLUSIONS

Although the behavioral design process is used as a tool to complement the traditional design practice, it's crucial that the design team focus on the behavioral aspects first and let these, guide the definition of the outcomes in the product, rather than adopting a more technical, cost and function driven mindset.

In principle, the outcome of a service or product should be a real-world impact. Nowadays, there is a tendency to influence and impact on users' emotions, knowledge or awareness in things that are inside users' heads. The goal of behavioral design goes further, into the practical impact on people's actual behavior and the world around them.

Additionally, designing for behavior change requires embracing the quirky ways in which the minds work, and how folks interact with their environment, to a better understand how innovative products and services can help them change their behavior. The secret of this process is the strategy, the behavioral science the research, the expertise and the data analysis behind a product because the aim is to help people become a better version of themselves using simplicity factors, triggers, motivators and rewards that make easier the path of changing current habits.

Regarding the concept of systemic design, this can be applied also in the health system area, where actually the wellbeing of a person is treated by different components instead of taking account connections and relations of mental and physical health factors to offer a better holistic treatment.

The systemic approach is also considered in these digital service project, where inputs and outputs of information are part of a complex communication system in which every exchange data can be communicative and interactive to become keystones of other nodes.

The result of this research is a connection of behavioral science, systemic design and interactive design as the roots of gee app, a pioneering solution for people who suffer overweight; a worldwide disease that has been increasing the last years and is not receiving yet the best treatment to overcome it.
Products that already exist have a lack of interaction and don't valuated the output data collected to reinforce progress, give feedbacks and motivate its user to achieve positive changes.

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