MAKE GRAVITY VISIBLE

A social movement to challenge our society to
MOVE MORE

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ABSTRACT
Gravity plays a vital role in our everyday lives. It provides the development of our muscle mass which fuels our brain's advancement and our ability to complete daily tasks. Yet we often take for granted the things we do not see. From hunting and gathering, chasing after prey, migrating from one place to the next, to growing and harvesting crops to long hours laboring away, we have felt gravity through millions of years in time.

Along with the rise of technology, we are witnessing the fall of our physical selves. Our lives have become busier, more stressful and our days behind a screen much longer. Within the past 30 years, gravity has been intercepted by the chair and the ratio of moving to sitting has been reversed. Instead of feeling this force within our legs and lower limbs, it has now been deferred to our fingers, buttocks and backs.

We spend the bulk of our days in a seated position, often behind a screen. Sitting has become such a norm that daily exercise at the gym is no longer enough to offset all the negative things done to our bodies in a sedentary posture.

We were programmed to move, but we’ve hacked our brains to think otherwise.

Prolonged sitting is a serious issue that should not be overlooked. The challenge is to change a habit that we’ve acquired from an early age.

The numbers are staggering, over 1.5 billion people worldwide are obese.(WHO. int, 2013) 5.3 million die each year from heart related diseases and diabetes as indirect result of the chair,.3 million more than smoking. (The lancet.com, 2012)

It is time to break the norm, adjust our perceptions, expectations and stop living in extremes and move towards moderation. It’s time to stand up and make gravity visible.

10/60: Make Gravity Visible is a social movement to challenge our society to move more, reminding people to be up and moving 10 minutes for every 60 minutes.

The goal is to challenge society to integrate movement within the home, work and societal environments through the support and influence of communal behaviour.

10/60 is facilitated by a website and a smartphone application. The website provides ideas shared by the community to help inspire movement into people’s lives. The app tracks a person’s daily physical activity levels and sends a reminder when he/she has been sitting for too long. How much a person moves is reflected by an avatar’s physical state as well as graphical data by the time of day. Challenges can be submitted within the inner circle of friends to encourage more movement.

The initial strategy around this topic was through the intersections of four subjects: human evolution, philosophy, behavioral psychology, and physiology. This concept was developed based on findings from foundational research, expert interviews, user tests, experiments and behavioral observations - in particular social influences and the underlying principle that motivation is different for everyone.

Awareness alone does not generate action. Motivating people to move more is beyond an individual problem - sitting is a societal and cultural issue and unless that is addressed, no long term changes can be sustained.

This project aims to inspire people to leverage their communities and integrate more physical activity in the home, work and societal environments.

Societal and cultural norms will not change unless we change together.

"Everything in Moderation, including moderation." -Oscar Wilde
Imagine a world where children's life expectancy is shorter than that of their parents by five years. In the USA, this can potentially become the reality because of the decrease in physical activity among the American youth. (Belluck, 2005)

An epidemic, known as the sitting disease, is invading every household, work environment and societies around the globe. We are sitting more than we are moving. Among other things, excessive sitting has been linked to obesity, depression, increases risk for breast and colon cancer, diabetes type II, and heart related diseases.

From the moment we wake up, eating breakfast at the dining table, to the moment we commute to work or school, being at school, eating lunch, going to meetings, commuting home, eating dinner, watching tv or reading - we are continuously in a seated position, but on different chairs.

When we have friends over, the immediate cultural norm is to offer them a drink and a seat. It's deeply rooted in our societies regardless of where we are from. We sit so much that no longer is the recommended 30 minutes of exercise everyday enough to offset the negative levels of physical inactivity experienced daily. (Katzmarzyk, 2009)

“The term ‘physical activity’ should not be mistaken with ‘exercise’. Exercise, is a subcategory of physical activity that is planned, structured, repetitive, and purposeful in the sense that the improvement or maintenance of one or more components of physical fitness is the objective.

Physical activity includes exercise as well as other activities which involve bodily movement and are done as part of playing, working, active transportation, house chores and recreational activities.” (WHO.int, 2005)

The human body has a tendency to conserve where ever possible, to that end, when certain muscles are not used, they begin to disappear, to use that energy for other purposes. The extreme scenario of such a depiction in regards to movement is that of muscle atrophy, something that I have personally encountered.

January 15th, 2007 marked a moment in my life where I knew what it felt to lose the ability to walk. I was in a snowboarding accident that left a laceration below my left knee leaving me unable to walk for two months. I was bedridden and could not move without assistance. After those two months, I was shocked to see the differences in size between my two legs - the left looked severely malnourished relative to the right leg, I had personally witnessed what muscle atrophy looked like.

Moderation is the key word. Things will not change over night, however, we can try to become critical of our physical activities throughout the day.

My goal is to encourage people to challenge the norm - and listen to their bodies. Our bodies are a complicated and intelligent system; it gives feedback on how to best care for ourselves. It is time to listen to it.

In order for us to embrace our movement, we need to embrace it on a larger, cultural, societal level. We need to start questioning how much our health is worth.

This report outlines the design process carried out to create the 10/60 project, a social movement aimed at reminding people to be up and moving 10 minutes every 60 minutes. It begins with the important research findings that were the foundation to understanding the sitting problem.

INTRODUCTION

sit v. to adopt or be in a position in which one's weight is supported by one's buttocks rather than one's feet.

sedentary adj. characterized by much sitting and little physical activity.

stand v. have or maintain an upright position, supported by one's feet.

ambulate v. to walk or move about.

move v. go in a specified direction or manner, change position.

moderation adj. the avoidance of excess or extremes, especially in one's behaviour or expressions.
1. RESEARCH
Museum visit, medical and physiological textbooks, research articles, newspapers, were read to gain an understanding of the medical and physiological aspect of human anatomy and movement. Experts for each specialty was later consulted to verify holistic understanding in regards to behavior pyshology and the sitting disease.

User surveys, self-experiments were conducted to observe these theories.

Existing technologies and market products motivating movement were briefly evaluated for their validity and opportunity.

2. IDEATION
Based on the research, prototypes around behavioral design were simulated through workshop, analog tracking, environment redesign, and sitting interruptions.

These were then packaged and wire-framed into an ecosystem through various user testing where iterations were developed in between each feedback.

3. FINAL CONCEPT
Based on the user feedback of various moments within the ecosystem, high resolution specs of the website and mobile app were designed to communicate the final solution.
A strong understanding of the sitting disease and foundational framework was essential in the development of the final solution. An overview of the relevant research is described below.

**Human Evolution**

If we were to reflect on the human timeline, we would find that within the span of the last 30 years, our technological life has drastically shifted. The amount of movement relative to sitting time we are experiencing now in comparison to the past millions of years, has been flipped. Biologically speaking, we are not designed to live the lifestyle that we’ve created.

**Timeline of Human Evolution**

- In the 1974, Donald Johanson, a paleoanthropologist, discovered Lucy, our relative from Ethiopia. Lucy was a bipedal, estimated to have lived 3.5 million years ago.
- 2.6 million years ago stones were used as tools.
- 800,000 years ago we were able to control fire.
- 800-200,000 years ago our brains grew in size.
- 12,000-10,000, the Agricultural Revolution, hunting and gathering was no longer the norm.
- 1760s-1830s: Industrial Revolution
- 1980s: Digital Revolution
- About 150 years ago, 90% of the world’s population lived off of agriculture - today 50% of the world now works behind a screen. (Levine, 2007)

During the 19th century, it was normal for many people to share desks that were at standing height in the office. Schools had desks that were able to be converted to standing positions (see image to the right) (The Art of Manliness, 2011) and designers had upright draft tables.

**Bipedalism**

The research around movement was first inspired by a visit to the Otto Bock Science Center in Berlin. Although Bock’s work is more related to prosthetics, he speaks to a lot about the importance of movement and the need for us to learn to move again. The interactive exhibition on walking revealed an overview of relevant information in regards to muscle and bone structures.

Bipedalism is the condition of locomotion on two feet. (Merriam-webster.com, 2012) What makes humans stand out among other mammals is our ability to walk and run on two legs for long periods of time. We are built to walk, yet we often forget to do more of it.

This mechanism that drives our movement lies in our complex central nervous system (the brain and spinal cord) and the muscles and bones that propels our motions. Movement always starts from the brain.

“Complex movements are planned an controlled in the cerebral cortex, the basal ganglia and the thalamus.” (Otto Bock Science Center, 2013)

The cerebellum and the brain stem works together to learn, control and coordinate new movements. (VanPutte, 2010)

The nerves carry the signals to the muscles. 90% of our muscles are utilized to keep us in an upright position. (Otto Bock Science Center, 2013)

Body movement occurs when our muscles contract - working with the joint and cartilage to enable movement between the bones, and the ligaments which manages the range of motion.

Humans have more than 600 muscles, categorized down by three groups: smooth, cardiac and skeletal muscles. Smooth muscles are muscles that (contracts involuntarily) are controlled by our nervous system, such as the digestive system, from the moment the food enters the body to its digestion. Cardiac muscles are muscles within the heart responsible for blood circulation. Skeletal muscles are muscles that most of us can see, they are the muscles that are attached to the bones via tendons and require our

Brains to signal their motion (contracts voluntarily). Bones move when the skeletal muscles contract, generating body movements. (VanPutte, 2010)

The saying of “use it or lose it” truly applies to muscles. Muscles are living tissues that when not in use, they face atrophy. (Otto Bock Science Center, 2013)

**Neuroscience**

The brain controls our thoughts, how we learn and use our memory to the way we move. The two core functions of our brain is to control behavior and regulate our body’s physiological processes. (Martin, 2010)

The brain sends signals through our nerves to muscles, producing movement and behavior. We are able to get an understanding of our surrounding environment and act accordingly. The second function works with our glands to regulate and control our body temperatures, blood pressure and nutrient levels, enabling us to maintain homeostasis (the stable state of body). (Martin, 2010)

The way we think, learn, and behave are results from our neurons, nerve cells that are responsible for the transferring of information throughout the body. (VanPutte, 2010)

Our brains produces new neuron synapses (connections of information exchange) when we are moving, enabling us to process things better and make connections between neurons so that we can do things more efficiently. Movement and exercise keeps our brain active and develop new connections. (VanPutte, 2010)

Humans are aware of the surrounding environment based on five senses: vision, audition, olfaction (smell), gustation (taste), somatosenses (body senses, touch, pain and temperature). However, none of these senses would be useful without the brain’s help to process the senses. Thus, keeping the brain nourished and happy through movement is necessary.

**Behavior Psychology**

The following outline of behavior psychology is mainly in regards to modern day societies where basic needs, such as food and shelter have been met.

Two key elements of behavior psychology are habits and self-efficacy. Habits are developed through repetition. A habit can be described as three elements of a cycle, “the Habit Loop” where a cue triggers an action, which through repetition, becomes a routine, followed by a reward. There is no one single way of breaking a habit that works for everyone. (Duhigg, 2012)

Habits are developed so that we can dedicate our brain power to other more relevant things, instead of constantly expending energy on things we do on a regular basis. According to Charles Duhigg, habits cannot be removed, but can be replaced. However, they can be changed by keeping the same cue and reward but changing up the routine in a way that assimilates to what is familiar.

An interview with Dr. Bernt Lindahl, a senior physician at the Occupational and Behavioral medicine at the Norrland Universitetssjukhus, confirmed thoughts around behavior motivation. He explained methods that could help people become motivated.

“The power of how people change depends on how they feel in life.” - Bernt Lindahl

There are two important aspect of motivation: how important we value the change of behavior and the belief in our abilities to deliver. The most important element of motivation is “self-efficacy.” (Lindahl, 2013)

Self-efficacy, a concept first developed by psychologist, Albert Bandura, is defined as, “the belief in personal ability to successfully perform challenging life tasks.” (Bandura, 1977) Until this component is fulfilled, motivation for change cannot be properly carried out and sustained.

There are four main sources that drives self-efficacy: experiences from people we deem as important, our own past experiences, verbal persuasion, and our physiological and affective state. Out of these four, our past experiences in life plays the largest role in the development of our existing self-efficacy. (Lindahl, 2013)

Self-efficacy can be improved through small goals. Small achievements are important propellers of continuation and self-belief, enabling the person to be more likely to make changes. The cycle to improve self-efficacy and development of new habit generation can be outlined as:

1. Set small goals that are
A little bit of stress is needed to drive motivation but when stress is too high, performance ability drops. (Lindahl, 2013)

An individual’s lifestyle choice is a function of internal and external factors. Not everyone is able to handle stress in a rational manner and thus to expect immediate lifestyle change based on risk is not enough. The diagram to the right displays the relation between stress and ability. A certain level of stress incites action, however, when stress levels are too high or low, performance (ability) declines. This is possibly due to panic behavior or denial where defense mechanism kicks in. Solutions should be empathetic to the different internal and external factors of how people cope with stress. (Lindahl, 2013)

On top of this, the right organizational systems have to be in place in order to provide support and maintain this positive outlook. Otherwise, any time there is stress and fear, an individual is more likely to revert back to what is familiar. (Duhigg, 2012) Because humans have a tendency to be attracted to things we find familiar, the intended audience is more likely to accept something new that is dressed in old habits. (Duhigg, 2012)

“If you want to change a bit, you must find an alternative routine, and your odds of success go up dramatically when you commit to changing as part of a group. Belief is essential, and it grows out of a communal experience, even if that community only as large as two people.” (Duhigg, 2012, p.92)

Social influence plays a big role in how to change a culture. Robert Cialdini, a professor in psychology and marketing, says that we are influenced most by our closest social group. We are sensitive to the “normative” behaviors of a community and gravitates towards a place where we feel we can belong, looking to our peers for our behavioral models. Cialdini is known for the six scientifically validated universal principles of social influence, shortcuts that guide human behavior:

1. Reciprocity: humans have a tendency to want to return favors that have been given to them. Being the first to give and the personalization and element of surprise of how something is given plays a huge role in the willingness of others to reciprocate.

2. Scarcity: a limited availability of an item is perceived as holding more value.

3. Authority: the tendency to be more attentive to a figure who has a sense of credibility and expertise.

4. Consistency: people enjoy being consistent in their actions - once a small commitment is made, increases the likelihood of carrying out larger commitments.

5. Liking: we have a tendency to like people who are similar to us, those who gives us compliments, and those who work towards similar goals.

6. Consensus: During times of uncertainty, people tend to behave according to how they see others act and behave. (Cialdini, 2007)

These six principles provided a great overview of the important factors in persuasion and social influence.

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**Graphical depiction of mortality rate based on quantity of sitting time from 1981-1993 from survey conducted in Canadian studies.** (Katzmarzyk, 2009)
The Silent Killer
Exercising everyday is no longer enough to offset the negative effects of prolonged sitting. Below is a summary based on the research findings on the dangers of sitting.

Humans were built to move. The brain is the main control tower that needs to be replenished through movement and the use of muscles. Movement produces positive body and brain chemistry, generating new neuron connections in the brain. The brain becomes happier and think sharper as a result. Lack of movement, adjusts hormone levels, causes the central nervous system to slow down - leading to depression, reduction in self-esteem, lethargy and less efficient productivity levels.

MAKES MUSCLE AND BONES WEAKER
Muscles is to help us move and counteract the forces gravity, by sitting, we are deferring the forces of gravity. (BeingHuman, 2011)

Prolonged sitting deactivates the largest muscle groups - signaling that they are not needed. Within less than an hour, our metabolism enters sleep mode. Instead of working to distribute sugars and fat, they are left alone to build up and clog our blood vessels and insulin becomes ineffective. (Nbcnews, 2013)

Weakened muscles reduces our walking performance, leads us to become unstable and more prone to injuries especially when we trip or fall because of reduced reflex capabilities. (BeingHuman, 2011)

SLOWS DOWN CENTRAL NERVOUS SYSTEM, LEADS TO DEPRESSION & REDUCED SHARPNESS
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Our largest muscles and bones (lower limbs) are being underutilized and weakened from over-sitting. Our backs and joints are in pain and becoming stiffer as a result of the poor postures and hunching over the screen. The core functions of our muscles is to help us move and counteract the forces gravity, by sitting, we are deferring the forces of gravity. (BeingHuman, 2011)

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Humans are adaptable creatures with an efficient machine that reallocates resources where needed, so when certain muscles are not being used, they begin to fade. Muscle wasting can occur immediately from disuse. A 48 hr. study found that there were immediate differences in muscle mass between participants’ legs. Participants were only allowed the use of crutches to move around, to prevent the use of one of their feet. (Macleans.ca, 2013)

However, because gravity is invisible - we often do not think about these scenarios.

REDUCES BLOOD CIRCULATION, CAUSE HIGH BLOOD PRESSURE & HIGH CHOLESTEROL LEVELS
Prolonged sitting leads to metabolic risk factors, factors that increases the risk for heart disease, type II diabetes and stroke regardless if an individual actively exercises. (Katzmarzyk, 2009) These risk factors place individuals at risk for heart disease and some form of cancers. 49,000 cases of breast cancer and 43,000 of colon cancer a year in the USA has been linked with prolonged sitting. Physical inactivity has been associated with an estimate of 21-25% of breast and colon cancers. (Scientificamerican.com, 2011)

In order to function, our bodies require a certain level of blood pressure (hypertension) and cholesterol, and good blood circulation. High levels of either can lead to dangerous consequences. (Genetic Science Learning Center, 2012)

Hypertension occurs when the pressure exerted on the blood vessels (veins and arteries) is too high. Hypertension increases the risk of heart disease, kidney disease, stroke, and other serious illnesses. (Genetic Science Learning Center, 2012)

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arteries) to circulate the blood elevates, placing a strain on the heart to pump harder. (Genetic Science Learning Center, 2012)
Potential consequences of hypertension are heart attack, kidney failure, and loss of vision.

Cholesterol is an importance source for the creation of cell membranes, the production of vitamins and hormones, and aid with fat digestion.

The human liver produces about 1,000 mg of cholesterol a day to keep the body functioning - the rest of the cholesterol is received from highly saturated fat from certain foods. The key is to not have more cholesterol than we need. (Mayoclinic.com, 2012)

Since cholesterol cannot be dissolved in blood, cholesterol is distributed to organs and tissues in the body by proteins called lipoproteins. There are two types of lipoproteins: high-density lipoproteins (HDL), the good cholesterol and low-density lipoproteins (LDL), the bad cholesterols. When LDL cholesterol levels are high, the excess LDL continue to circulate in the blood until it is used. If cholesterol levels maintain high, these LDL build up and form “plaques” in the blood vessels and reduce blood circulation. HDL searches for excess cholesterol in the blood and transports them to the liver to be broken down. (Mayoclinic.com, 2012)

High blood pressure and high cholesterol are the leading causes of heart disease and stroke. Both (glucose) levels, but when we are not moving, we enter idle mode and blood sugar levels increases. Insulin helps distribute glucose throughout our bodies; when there is too much sugar in the blood, the sugar coats the blood cells, reducing the circulation and oxygenation of tissues, making insulin less effective. This results in the slow down of metabolism, affecting weight fluctuations, leading to Diabetes type II. For every 2 hours sitting, there is a 7% increase chance of getting diabetes.

Interruption of sitting time can lower waist circumference. People who frequently take more breaks in between sitting, has an average waist circumference of 4.3 cm less than those who take infrequent breaks. (Medscape.com, 2011)

“High amounts of sitting cannot be compensated for with occasional leisure time physical activity even if the amount exceeds the current minimum physical activity recommendations.” (Katzmarzyk, 2009)

“...physiological mechanisms associated with excessive sitting are different than the physiological benefits of regular exercise.” (Katzmarzyk, 2009)

1 in 10 deaths is caused from heart disease, diabetes and breast and colon cancer. 5.3 million die every year out of 57 million deaths. (The lancet.com, 2012) On average, Americans spend 7.7 hours (54.9%) of 15.4 waking hours per day in sedentary behavior. (Matthews, 2007)
Case Studies

There is no denying that sitting is bad for us. Several case studies conducted all over the world have traced prolonged sitting to the development of heart-related diseases, diabetes and some forms of cancers. Below is a briefing on prominent studies.

UK

In the 1950s, Jeremy Morris, a British epidemiologist, researched active conductors and compared them to the seated drivers of double-decker buses. He found that conductors had less than 50% of the heart attacks experienced by their sedentary drivers who sat for 90% of their shifts. (Nytimes.com, 2009)

In London, from a study of 19,527 students from ages 5 - 19, children who walked or biked to school outperformed their counterparts who were dropped off by cars. Their exercise habits played a bigger role in relation to their levels of concentration than that of breakfast and lunch. (Post.jagran.com, 2012)

AUSTRALIA

Watching television, a common activity often conducted at home, has been linked to cardiovascular diseases. From an Australian research study, 8,800 people were followed up over a 6 year period. The findings linked each hour of television viewing to 11% increased risk of all-causes of death and 18% with cardiovascular related mortality. Independent of smoking, high blood pressure, cholesterol, level of exercise, and diet, people who watched 4 hours of tv every day faced up to 80% risk of death from cardiovascular diseases. (Dunstan, 2010)

2 hours of television viewing has also been linked to an increased risk of development of diabetes type II by 20% (Time.com, 2011)

CANADA

Another research study in Canada followed 17,013 people (7,278 men, 9,735 women) over 12.9 years. From observing the mortality rates with correlation to sitting time, it was found that regardless of how physically active some of the individuals were, there was a strong correlation between sitting and mortality rates. The author wrote, “This is an important observation because it suggests that high amounts of sitting cannot be compensated for with occasional leisure time physical activity even if the amount exceeds the current minimum physical activity recommendations.” (Katzmarzyk, 2009)

USA

American Journal of Epidemiology studied 53,440 men and 69,776 women who were free of diseases at the beginning of the research. Within 14 years, 11,307 deaths in men and 7,923 deaths in women were recorded. Women who sat longer than 6 hours during leisure time vs. 3 hours a day had a 40% higher likelihood of death and men about 20%. Cardiovascular disease had the strongest association to the deaths recorded. (Patel, 2010)

James Levine, an obesity expert from the Mayo clinic, did a study to figure out how two people can eat the same food and not exercise, but yet one gains weight while the other does not. (Nytimes.com, 2011) Using motion-tracking undergarments - he discovered that people who did not gain weight were unconsciously making up for the loss movements (from not going to the gym) through what he calls, “Nonexercise Activity Thermogensis,” (NEAT). NEAT is the energy used from all physical activity expenditures that are not from exercising or active sports. For example, life at work, cooking, playing music, etc. (Levine, 2007)

Levine explains that the way we use our energy can be divided into 3 components:
1. basal metabolic rate (60%): the rate of which our bodies use the energy to maintain core body functionalities - this varies by body size.
2. thermic effect of food (10%): the energy required for food digestion.
3. Activity Thermogensis and NEAT (30%): respectively, energy from exercise if any and the nonexercise movements exerted. (Levine, 2007)

The diagram above, based on the original one provided by Levine, explains how much calorie is burned per hour depending on the movement.

Lean people moved about 2.25 hours more than those who are obese. There is a 2000 kcal per day variance between two people of similar build. (Levine, 2007)
Market Technologies
Market technologies were briefly evaluated to gain an overview of today’s existing products.

The simplest examples are computer softwares that remind users to stretch. However, as the image to the top right indicate, stretching programs take place in seated position. This overlooks the utilization of the biggest muscle groups (lower limbs) and need to move.

Much of today’s health monitoring technologies require an external device, usually in forms of a wrist band or watch that is coupled with a smartphone app.

For example, Nike Fuelband has a futuristic appeal for monitoring steps calculated in NikeFuel points to compare within an individual’s community. They have strong marketing communication of how it can be integrated in people’s various lifestyles. However, these advertisements do not fit most people’s typical work schedules.

Quantified self, being able to collect and track data of oneself and share it with the community has grown popular these past few years. Many people become motivated overall because by wearing a tracking device, they act as a reminder to choose the stairs over the elevator, etc. However, there are limitations to their capabilities.

Financially speaking, for people who are already paying monthly gym memberships, these devices may seem trivial or unnecessary additional costs to carry around ($90-$200). In Fitbit’s case, they have a family of products that tracks different motions (sleep, movement, weight, etc.) For bracelets and watch wearers, these items are not allowed in full contact sports.

Largely, they do not work for everyone, some people do not want to have a bracelet or a device constantly on them in addition to the typical items carried (wallet, keys, phones). The non-wristband devices that “clip” onto a clothing article can be easily misplaced or lost.

Most importantly, many of them do not monitor how long a person has been inactive and motionless - for let’s say 2-3 hour period. They lack a mechanism that reminds people that they haven’t been moving, which is the moderation element of this project’s goal, irrelevant of physical exercise.

Lastly, just receiving tracked information is not enough. It is estimated that only the population who is keen on data tracking adjusts their behavior based on their personal data. They compose of about 10% of the user population. (Spectrum.ieee.org, 2013)

The immediate thought that arises is why have an extra device when movements can be tracked via smartphones? As many people already tend to carry them around, it seems to be most viable form and provides health data for free. The phone already has GPS and accelerometers that can locate where people are and how much they’ve moved. A recent app, “Moves”, that was released in late January for the iphone has already hopped onboard with this thought.

The biggest challenge in this project is that everyone has different levels and methods of motivation. The solution should be conveyed in a simple, enjoyable seemingly effortless way that does more than just track data.
Analysis Mapping
In order to structure all of the research, a web mapping was created. The mapping outlined the major concerns with each researched subject explored (behavior psychology, physiology, neuroscience, human evolution, etc.). It acted as a reference guide of important factors to consider during the ideation phase.

Idea Criterion
Based on the research findings, an idea criterion was written as an initial benchmark for evaluating upcoming ideas in terms of its viability to motivate people.

For example, ideas should provide an element of freedom, where individuals are not forced to conduct in a certain manner, but have the flexibility of various methods. It should promote moderation in a way that accommodates an individual’s existing lifestyle.
User Surveys

Initially, an online survey was distributed to social networks, mainly students at the Umeå Institute of Design (UID) to gain a sense of how much people move throughout the day.

After filtering the responses for incongruences, 42 surveys were analyzed. Out of the 42 respondents from the survey, 31 people said that they sat for at least 7 hours every day.

28 of the 42. Since many of the respondents from the survey was from UID, the campus became a case study for experimentation. The unique thing about the UID campus is that every single student and staff has access to height adjustable tables, a total of over 137 height adjustable tables. However, 73.8% of the UID group surveyed do not use their height adjustable table. If this percentage was applied to the number of tables, about 101 desks are not being properly utilized. A head count was conducted to confirm these approximate numbers. This proves that providing the right equipment or workstation alone is not enough of a motivation for people to use them.

Although most of the participants stated that they sit for at least 7 hours a day, when asked how healthy they rated themselves the following responses were given: 5% not healthy, 57% healthy, 33% moderately healthy, and 5% as very healthy. Most of the reasons were equated to going to the gym at least twice a week. There seems to be a misunderstanding between healthy and the dangers of sitting.

The pie chart on the right displays an approximate picture of how a day can broken down in sitting (100% blue) vs. not (10% blue) from the survey. Participants worked more than they sleep and conduct many activities throughout the day in seated positions - more time is spent watching leisurely than eating.

There is a huge time and health care cost opportunity in the reduction in the amount of sitting. Each year, US employers pay about $200 billion due to employee stress-related causes. (Employeesupportnetwork.com, 2000).

On average, surveyees spent 14.67% (3.5 hours) of their day unproductively at work on activities such as: websurfing, facebook, personal emails, blogs, phone calls.

An infographic by Atlassian outlines similar thoughts, the average office employee:

- check their emails 36 times in an hour
- 16 minutes is the average time it takes to refocus
- 50% meetings are considered time wasters
- a person experiences, on average, 56 interruptions a day, 80% of which are trivial
- 2 hours are spent recovering from distractions
- 60% or less of a work day is used productivity

There is an opportunity to replace these hours with more healthier movement habits, reducing stress levels and improve productivity.

Visualization of the survey result on an overview of a typical 24 hour separated by seated activities.
**Self Experiments**

Walking the talk, embracing the topic and authenticity matters. Thus over three months ago, the challenge was taken to work in the standing position at the early stages of the project. Throughout the process, experimentation was done with various equipment used into today’s office space.

**Treadmill desk**

The treadmill desk was used for an hour to read as well as take notes on the computer. Initially, reading while in motion felt unfamiliar, but following ten minutes, it became automatic. The width of the treadmill limited the range of movements and caution must be taken to avoid moving too far left or right of the edge.

Dizziness and a sense of imbalance was experienced after departing the treadmill. Overall, it works well for simple tasks, such as reading internet articles and typing or checking emails. However, for precision work, such as design related tasks, it is simply not possible to have efficient outcomes. Moving while working felt like an unnecessary layer of multi-tasking. We are humans, not robots.

Realistically speaking, it is a rather large financial overhaul to request employers to exchange all their existing office furnitures and replace them with height adjustable ones and purchase treadmills. The noise levels and energy bill would also rise dramatically.

**Triangular seater**

There was a three point chair that enabled people to sit in various positions. It had a playful element that enabled rotational arc movement through its rounded bottom. One can lean forward and put more force onto the legs - however fear of slamming one’s face against the table was felt. When wearing a thinner pair of pants, the seat can rub uncomfortably against the thighs.

**Fitness Ball**

Fun way to sit because it provokes thoughts around movement. Back strengthening exercises can be conducted while waiting for pages to load. The positioned found most enjoyable was when the ball rested between the butt and heel, and balancing it over the feet. This ball is definitely cheaper than a typical chair.

**Standing Mat**

A cushioned mat from a staff member at the school who always used it while standing was borrowed. An experimental trade-off was made to find if there were differences between being on a mat or not.

Initially, the cushioned mat felt great supporting the feet and legs in comparison to the linoleum flooring. However after a full day’s use, body weight began to sink in and the difference between the floor and the mat diminished. The staff member also felt no differences during that week.

After standing for a couple of months and sitting to mainly eat, it has now become difficult to work in a seated position for extended periods.
Daniel Pink, a best-selling author and career analyst, spoke about three building blocks that organizations need to provide to incentivize their employees:

1. Autonomy: The urge to direct our own lives
2. Mastery: The desire to get better and better at things that matter
3. Purpose: The yearning to do something larger than ourselves

(TEDGlobal, 2009)

These three blocks exemplify the existing perception people have within them. My hope is that this desire to change from the norm and develop themselves, can become the driving force of the final solution, where people become the change that they want to see.

The goal is to motivate others to move more. The difficulty lies in motivating people to adapt a new habit that does not immediately provide instant gratification.

I have to be mindful about the fact that people make connections at different speeds and different moments. Habits cannot be changed all at once. Any time someone feels forced, the flight or flee defense mode kicks in and all efforts can be lost.

In order for people see the importance of any change, they themselves have to get excited, emotionally captured and recognize the fun in it, and generate a craving/reward from it. Small achievements are important propellers of continuation and self-efficacy, enabling the person to more likely make future changes. The self-efficacy cycle of setting achievable goals, monitoring behavior, providing feedback from various sources, and enabling reflection is a notable property that should be included in the final design.

There is a huge time opportunity for developing something that fits during people's unproductive moments of the day. How can the cues and triggers provided from emails be moments of opportunities to move more?

I want to design an experience where people can try it for themselves and find the right driver for their motivation. I want people to discover their intrinsic motivation - to do something because it matters or that it is interesting to try.

Prolonged sitting is a serious problem that gradually deteriorating our minds and bodies worldwide.

Umeå Institute of Design staff and students were observed and used as a prototyping ground for integrating movement throughout this project.

Guiding Principles of Design

- Keep it natural: we are humans, not robots
- Promote moderation
- Emotionally capture the user experience
- Generate self-efficacy through community methods
- Provide visual, simple and intuitive experience.
- Be flexible in different levels of engagements
- Challenge the norm
Daily Logbook
To get a stronger feel and prototype the possibilities of encouragement by building awareness of the situation and awareness of self, 7 daily log books were designed and distributed to a student from each program at the design school.

The logbooks were intended to help participants track their daily schedule down to the hour - how much movement was experienced for that day, including sitting, standing, 10 minutes of movement, laying down. See Appendix A for the daily reflection form.

5 point process
In addition to tracking movement, emotions were captured through graphs. The goal was to keep the logbook open and enable them to be the change-maker, adapt the book to any habits or emotions they wish to measure.

1. Pre-interview: explaining research and insights to each participants about dangers of sitting.
2. Interview them about their daily schedule, habits and perception about movement.
3. Distribute the daily log.
4. Send reminders to complete the logbook.
5. Post-interview to evaluate if any changes have been made in regards to movement and overall well-being.

Participant background
A heterogeneous representation for the daily log was desired. Students were selected based on the different design programs attended and had different ethnic origins:

- Industrial Design Intensive (Ethiopia), BA Industrial Design (Sweden), MA Transportation Design (S. Korea), Advanced Product Design (Austria), MA in IxD (Hong Kong and Spain), Ph.D. (Italy) and one staff member.

It was good to have a mixture of gym goers and people who sat for a long period of time. Some moderately went to the gym, others infrequently. There was a strong mix of students who have tried standing before and never tried before. Standing was motivated and reminded by seeing other classmates stand and utilize the desk.

Key Learnings
Some participants provided detailed explanations about their day to day activity - using it as a personal diary. Two participants wanted a copy of the logbook for continued logging. Others did not fill out the book completely.

Learnings from the experiment included:

- Reflection and analog tracking doesn’t work for everyone, awareness does not lead to action, there needs to be a purpose for people to move, weekends are considered to be more relaxing.

The largest lesson learned was that awareness does not lead to action. Every participant received a 20 minute presentation about the dangers of sitting - however it takes more than awareness to generate change.

“Describing and explaining the world, no matter how accurately or well it is done, does not prescribe action or change”
- Dr. Harold Nelson

A dinner party was hosted to gain insights about how participants felt about the reflection logbooks.

Summary from Reflection Dinner
For some, the task was too time consuming - it required a lot of effort to monitor movement manually. It was not worth the effort.

Additionally, being highly stressed from school projects made it more difficult to establish new habits. Even though they knew its good for their health, it was de-prioritized.

When standing was tried, immediate gratification was missing in comparison to sitting. It was easy to return to the chair because it was familiar and comfortable.

The way people were taught to sketch or learned to do design work was in a sitting position, so it was more difficult and not worth it to make the switch.

Monitor height had to be adjusted because of the difference from sitting than standing.

Competitive people mentioned that making it a challenge and keeping scores would incentivize them.

It was easy to get absorbed when working long hours on the computer, forgetting about the surrounding environment.

Time for moving needs to be reserved and embedded in the daily schedule otherwise it receives low priority.
Early Adopters
Simply by having a discussion around the topic of moderation and the need for movement, places the power in individual’s hand to make those immediate changes. Above are some photographs of how people have incorporated standing into their everyday work and school lives.

Two classmates created “standing desks” at their home work stations by standing a smaller table on top of the larger ones. During presentations nowadays, the space in the back of room welcomes those who wish to stand as well as sit. Standing in the back reminds others of this possibility. Even the IxD program director has started standing while working since the research presentation.

Printer Room Refurnished
Many students often complain about the queues from the two scanning and printing computer terminals in UID printing room. Coincidentally there were two height adjustable tables lying in storage unused. The opportunity was explored and the nonadjustable tables were replaced and chairs removed. Students immediately noticed the change, many positive comments around the small change was received.

From the observations and brief interviews, standing led people to linger around less and focus more on the task. The perception of the queue was diminished.
Movement Workshop
A workshop on movement was conducted to gain a stronger sense of what motivates people to move more as well as prototype different movement activities possibilities. Ten students from various programmes participated.

Workshop activities included: a comparison of what motivates people to move when they are super busy compared to when they are feeling lazy, why do people move vs. sit, how to integrate movement into a sitting journey, an outdoor brainstorming and how to make gravity visible.

The workshop was also designed to challenge the participant’s perception of sitting and create “ambassadors” to spread the word around the dangers of sitting.
Busy Bee vs. Couch Potato
Participants were asked to imagine what it would take for them to get up when they’re feeling like a couch potato vs. busy bee. Patterns emerged among what type of things provoked movement: Food (cravings/hunger), bathroom (biological necessities), auditory disruptions (sounds/music), social (friends/family), and environmental forces (chairs breaking, fire). It was interesting to hear that none of these activities were self encouraged for plain health reasons.

When asked about things participants enjoyed the most - alot of these activities described were enjoyable because it created emotional and mental responses, providing a sense of accomplishment and confirmation.

Moving vs. Sitting
Participants were then asked to describe the following four questions:
1. Why do you sit?
2. Why do you move?
3. What habits do you have that you know is bad for your but you still do it?
4. Why do you do it any way or how does it make you feel?

Responses are categorized in Appendix [I] The main reasons for movement were destination reasons, goal driven, biological necessity, enjoyment/explorative reasons, exercise reasons. People sit because of emotional responses: makes them feel good, relaxing, to gain clarity of thought and environmental reasons: social structures, desk and work restrictions.

What needs to happen for movement:

- food
- bathroom
- auditory
- social
- environmental forces
- opportunities
Sitting Journey
A typical journey of an office worker was drawn on the white-board. Participants were asked to reflect everything from the previous sessions to brainstorm around how to involve movement into the sitting journey.

Ideas included a mixture of mandatory reinforcements from organizational structures, setting reminder mechanisms to move more, redesigning chairs to be painful to sit on, rearrangement of architectural spaces, making meeting spaces more fun, to social campaigns

Outdoor Brainstorm
The next session took place outdoors so that participants can be in the setting that they will brainstorm around. They had 15 minutes to respond to why people did not go outside during work/study hours and brainstorm around how they can motivate people to do so on an individual and societal level. Everyone wore A5 cards and formed a circle so that they can use each other’s backs as a writing board. The activity showed that gaining fresh idea and fresh air simultaneously was possible, but under a certain time constraint because of the cold temperatures.

Bounce around ideas
The last activity was around how to make gravity more visible. A large fitness ball was wrapped in a plastic bag so that people can build upon each others ideas of how to make gravity more visible. This was to prototype a different method of brainstorming in a physical manner.

Workshop result examples can be viewed on Appendix B.
**Workshop Synthesis**

All the insights and ideas from the workshop were clustered and mapped into various webs. Areas of opportunities and patterns were identified that led to inspiration for the next step of ideation and prototyping.

Essentially, the required solution had to be flexible and open to various modes of behavioural design.

**Idea Sketching**

Based on the workshop feedback, sketches were made of potential ideas of positive disruptions that could be implemented at UID. These ideas ranged from small scale quick implementation to larger scale more time consuming ones. The ideas had a mixture of analog object to human, human to computer, human to environment, and human to human interactions.

**Next Prototyping**

Evaluation was conducted to compare the viability and difficulty of executing the ideas. Selection was made based on how the ideas provoked movement: awareness, challenge, provide a purpose or serves to remind people. The ideas that was judged as being most plausible was transferred onto A6 size cards. These card outlined what type of material and points of authority to speak with in order to execute the idea.

**Grouping the Ideas**

The ideas were then categorized around an ecosystem of three layers: the home environment, work environment, and societal environment. This ecosystem later served as guide in developing a design solution.
Positive Disruption

Disrupt the Status Quo

Challenge

Awareness

Provide a purpose (reward)

Healthcare costs

Insurance costs

Peer pressure

Walking Buddies

Break/Question the Norm

Work outside

Architectural
(approaches)

Walking paxels

table tests

Vibration
model

Grip

Tape

gestures

GPS sensors

limited

Vending machine

90 min

Outdoor

strategy

Racquet box

Bedlington

Golf

jump rope

streetball
call

Live Pacman!
April Fools
The April Fools idea was prototyped for its ability to bridge awareness and action to a large group. The goal was to see how long people would be willing to try standing and if their reactions would be influenced by their neighbor’s.

Over 137 tables in the school are height adjustable, yet only 20% were used. It was the perfect testing ground to interfere and see how normative group behaviour can truly be affected. What would happen if everyone started the morning without a chair and a table at a standing height? April Fools day could not have arrived at a more appropriate time.

After speaking with the head of the department, fire marshall, and each programme director requesting permission to interrupt, the experiment was approved. Unfortunately Easter holiday coincided with the experiment; the infographic poster had to be created in a day for printing. The poster’s purpose was to communicate and build awareness around the sitting issue in case people wanted more information.

Six other schoolmates were recruited to collect 137 chairs and relocate them to the bottom floor of UID’s three floor building. Every desk received a “Surgeon General” note designed to express the dangers of sitting and challenged the individuals to stand up for the day.

Cameras were set to see the differences in how many chairs remained hour by hour for the next day.
Results
Some general trends surfaced on how people reacted to their missing chairs: a few people were upset and immediately picked up their chairs once they saw the note; others were confused but adapted to the change and decided to try it for a few hours; others borrowed chairs from nearby meeting rooms as substitute or their peer’s chair to avoid picking up their own; or resituated themselves in rooms with chairs. Some people decided to try it for the whole week. There was still 93 chairs left after the first day, 38 after the first week and 34 chairs left after two weeks.

The experiment worked better than expected. More people alternated between standing and sitting. Previous normative behaviour changed, mainly because students reminded each other the possibilities of working while standing. It no longer looked weird to stand, knowing that others were also doing it. Clusters began to form in different areas of the studio, some groups mostly sat, others alternated, and others stood as much as they could. Some people took the challenge up to two weeks. A couple of students came up to me to say that it was a great experience, “I’ve always wanted to stand, but never tried but you really need an external force (such as that experiment) to push you to try - and it’s not so hard after awhile.”

Overall, the experiment was a success. It provided the scale of interuption necessary for a memorable reflection on moderation. After 4 weeks, students who never stood up were developing a new habit of alternating their posture.
Framing the Concept Direction
From these experiments, and sharing with people about the sitting disease - there is no question that word of mouth plays a big role in developing reflection around the issue. A school mate mentioned, “Ever since you started the project, I feel super guilty every time I sit. I’ve never thought about it this much.”

Friends have also been affected. A friend told her co-workers about the sitting disease and that alone started to shift the way they worked. Those with standing desks at the office started to use them more.

Most of the world does not have the luxury of height-adjustable desks, as it is the case in Sweden. However, they can implement other methods into their work and home life that would encourage each other to get up and moving every hour.

These small steps of reflection and commitment are important in the development of larger commitments. And thus, the packaged solution had to embrace people at all levels of commitment. There needed to be a platform that supported people from becoming aware to taking action: a social movement on movements.

The habit of sitting cannot be undone unless society begins to alter its perception of the cultural norm. No single product can make this change alone. Through inspiring and integrating movement in the home environment, at the work place, and on a societal level - the status quo can then be challenged.

We have everything need: muscle, brain and gravity, we just need to use them more wisely.

In order to present a cohesive design solution for the sitting disease, an ecosystem had to be developed, enabling people to integrate movement into their lives, their way. The fastest method of reaching a large audience and changing social behavior is the internet.

The medium of communication chosen was a website and a mobile application for its viral reach.

The solution aims to provide a creative common platform where people can participate in the integration of movement within three spaces: home, work, and society. People can upload or download ideas to the community that provokes movement into these spaces. The mobile app tracks their movements, quantified as “gravity points”. How a person moved was reflected by a graph as well as an avatar on the mobile app.

Information Hierarchy
The first user mentioned there was too much information presented on each wireframe. He started drawing on the sketches to indicate what he would
prefer each section to display. This immediately led to the prioritization of certain elements over others.

**Icons**
Clarification of what type of icons to represent when a movement idea is liked, tried, and shared were evaluated. Originally a heart and a heart with a check were used to represent liked and tried the activity, respectively. Having two hearts for separate actions caused confusion. Further icons were validated for its appropriateness of each task.

**Movement Reflection**
The second user test liked the idea of how the avatar evolved depending on the user’s movements because it provided something more fun to look at than just data. He did not like the idea of recording himself to prove that he had completed the challenge.

He questioned the point of the web browser, which was further emphasized to be the main hub of which ideas can be accessed by general public. In particular, those who are interested in the movement but do not own a smartphone.

**Keep the Interaction Simple**
The third user wanted something simple to use. He showed an example of his favorite app, the POVIO app where he easily update friends on what he’s doing at the moment. (See image on top left of page) This user did not care about the avatar, he preferred the data and was more likely to view his own data than his inner circle’s.

**Avatar vs. Data**
The first user said the avatar could work if it did not look to realistic, “No one wants to see themselves getting fat, it can’t look real.”

The fourth user enjoyed the avatar, “If I saw an avatar of me get bigger, that’s not a good sign - I would be affected.”

The fifth user preferred the avatar but mentioned that the it didn’t matter if she had the data graph also because the information is so simple. However it is more fun to see an avatar of oneself getting fatter or older rather than just data.

**Messaging**
For one user, the library of movement motivation wasn’t necessary - she preferred to send positive messages to her friends. She thinks that to get people to improve themselves, support is necessary. And thus the chat element was then included.

**Movement Data Editing Capabilities**
The fifth user mentioned if she could adjust her gravity points for the moments that she would not have her phone on her, such as going for a jog or to the gym. Thus, an edit component of missing data was added to the app.

**Horizontal vs. Circular Graph**
A horizontal and circular graph visualization of the data tracked was evaluated. The horizontal graph was chosen because people were more familiar with that layout.

**Movement Reminders**
Users have the option set up movement reminders for when they have sat too long. Two users mentioned that the sound should not be annoying or a long melody. The result should vibrate like an SMS. Optionally, it can provide suggestions on what to do with the break every now and then.

**Challenges**
Having these movement activities become challenges within an inner circle tested well. One user mentioned, “I would accept or else I would feel like a coward.”

However, publicly proving that they’ve achieved a challenge by uploading a video did not test well.
CONCEPT PHILOSOPHY

WHAT
Gravity plays a vital role in our everyday lives. It provides the development of our muscle mass which feeds our brain development and our ability to complete daily tasks. However, because it is invisible, we often do not see nor think about it, so the goal is to make gravity visible.

Awareness alone does not generate action. Motivating people to move more is beyond an individual problem - sitting is a societal and cultural issue and unless that is addressed, no long term changes can be sustained.

10/60: make gravity visible
is a social movement to integrate walking into a sitting dominated culture. The objective is to build a positive community of stronger, smarter bodies to promote healthier lifestyles with the notion that we should be up and moving 10 minutes for every 60 minutes.

WHO
The project targets sedentary desk workers, however, it remains open to anyone who wants to inspire themselves or others to move more. The platform consists of active and passive movers and idea generators.

We are influenced most by our closest social group - people like to belong and often look to peers to see how they should behave.

The solution starts with one individual change, an influencer of his/her network who sets the wheel in motion for his/her smaller networks, collectively towards a larger community.

The goal is to generate change in a way that creates meaningful impact. The original objective was to motivate people to move more, but this alone does not generate long term changes. In order for this action to permeate and generate sustainable changes, we need our society and culture to embrace the need for movement. It should not be seen as socially awkward to take a break, to stand to work, or to dance in the middle of the office. Otherwise it is too easy to slip back into the chair.

10/60 SOCIAL MOVEMENT OBJECTIVE

HOW
The 10/60 strategic objective can be described by the bell curve below. Influencers, people who are motivated to integrate more movement, are supported by the 10/60 shared idea platform. Gradually they can infiltrate the New Majority through their influence and actions. New societal expectations will emerge as more people embrace movement integration. The objective is to not force people to stand more or to change the habits of those who are set in their ways - the solution is not catered to these people. As research has shown, when people have low self-efficacy, they have low motivation for change. However, these Late Adjusters will arrive naturally when they are personally ready and as an indirect result from the newly developed societal/cultural norm of interrupting sitting time. These changes in normative behaviour is the root of the social movement.

The key is to help people to enable themselves to be self-sustaining. The hope is that people can develop the mindset and tools to their sitting situation while inspiring others along the way.

We have everything we need to make this happen: our brains, our bodies and gravity - we just need to connect them together.

WHY
The internet is the fastest method for sharing ideas and thus a web platform and a smartphone was chosen as the communication channels.

The main objective of the smartphone is to provide added value where members can track and reflect on their movements as well as challenge their community to break from the sitting norm.

The smart phone is the most viable and logical form to log movement data because there is no extra cost and many people already carry them on a normal basis.
The Inner Workings

The above diagram depicts how the 10/60 platform works. Yellow outlines what is visible to the public and blue outlines the benefits of member access.

Although all the ideas can be viewed by general spectators, in order to partake in the movement with inner circles of friends or book ideas through “Liking” “Downloading”, individuals must sign up.

The internet was selected as the medium of communication for its mobility and ability to deliver the 10/60 message globally and virally. It operates through two mediums, the website (public facing) and the smartphone app (private facing).

The website serves as the main hub for which ideas will be exchanged for members of the movements as well as spectators.

The smartphone app provides a sense of accountability. By downloading the app, users are reliable for the wellbeing of an avatar that he/she creates.

The phone acts as a pedometer that calculates the person’s movement based on the embedded GPS and accelerometer. These movements are then quantified as “gravity points” earned throughout the day.

How a person moves directly affects the state of the avatar. For example, it can either age or become fatter as a result of lack of movement. Gravity points and avatars can be visible to a person’s inner circle of friends and family.

Design Guiding Principles

- Motivation is different for everyone
- Moderation is key
- Keep it natural, we are not robots, we have everything we need to move
- Keep it simple and intuitive
Curating Ideas

“Because just doing something disruptive is annoying, it needs to be disruptive in ways that create value for consumers - so you have to work it through a process, like prototyping and experimenting, to work out exactly who is going to find value in that disruption.” -Luke William, a consultant of innovation and strategy (DisruptiveThinking.com, 2011)

The emphasis on disruptions that generate value, not annoy people, served as a word of caution for the final design.

After speaking with Pop Culture Hacker, Jonathan McIntosh, known for his culture remix work, it was confirmed that seeding a positive foundation for 10/60 was necessary for a strong beginning.

In order to achieve this and avoid the “Youtube mess” experienced with unfiltered flagging, a set of submission guidelines for uploading ideas to the 10/60 project was needed:

1. All ideas uploaded has to be tried and proven
2. All ideas are free to use by everyone, the more iteration the better
3. Keep the energy positive and content suitable for all ages
4. Has to provide a purpose or added value: positive interruptions that are not annoying
5. Provide people with sense of freedom of choice
6. Have fun

Ideas will constantly circulated on the home page based on popularity and number of people who have tried them. Commenting has been disabled for initial moderation purposes. Video moderation will first be facilitated by administration and then gradually monitored by people with a certain level of gravity points earned.

The hope is the 10/60 platform will have a positive community of true believers who can uphold the core ideals of the movement. Once a positive community has been established, crowd curation can take flight and more features, such as commentary can be embedded.
Accountability and Self-Reflection

By downloading the app, movements are tracked by the smartphone based on GPS and accelerometer. Tracking movement provides a hassle free method of accountability about physical activity levels. This feedback promotes self-reflection about how much one sits and move on a daily basis.

Tracked movements can be visible to family/friends. How much people move are directly reflected on an avatar of their creation. Users create their own avatar based on hairstyle, and facial looks. People can choose to set their avatar to lose/gain weight or get young/older as a result of their tracked movements.

The avatar is also designed to reduce the sensitive emotions around directly telling our friends/family members that he or she is out of shape. Instead, they can say that the avatars are not doing so well.
Home Page
Before the final layout was determined, user feedback was received to see if the website served its purpose. The following layout was based on these feedback (See Appendix D).

The layout of the 10/60 website is designed to look clean and simple.

Top Bar Navigation

Awesome Weekly Movements
Good ideas are featured on the main page, selected by staff for weekly inspiration.

Idea Library
Various ideas can be shared in forms of challenges, infographics or campaigns to integrate movement into home, work or society.

Ideas are categorized by the latest submissions as well as most popular. On the home page, they are mixed by themes and continue as an endless scroll. Click on top bar navigation to filter by themes.

Avatars
Creators of each ideas are represented by their avatars which can also be used to contact them.

Title and Type of Idea
Ideas are labeled by title and whether the idea is a challenge/infographics/campaign.

Environment type
Indicates if the idea was created for home/work/society.
Join the movement
Signing up to become a member of the 10/60 community is intended to be an easy process. Aside from being part of a positive support network, members have access to uploading and downloading ideas, self-tracking of physical activity, sending and receiving of challenges from inner circle of friends, and notifications when he/she has been oversitting.

Example 10/60 Idea
Once an idea is clicked, a new page overlays the home page. The top half displays the video file or image file of the idea and the bottom half describes the details of the activity.

The avatar of the person who created the idea can be selected to contact the user. Followed by the title and type of idea it is along with a brief description from the creator.

The following actions can also be made in relation to the idea:

Gravity Points
This activity is worth 1500 Gravity points - this number also indicates the relative level of difficulty required to accomplish the task.

Everyone in our school works on a height-adjustable desk, however only 20% of these desks are used as they are designed to alternate between standing and sitting positions. 157 chairs were removed to challenge students and staff to try standing for the day. Permission was requested from administrators and fire marshal to ensure safety of execution. It no longer looked weird to stand, knowing that others were also doing it.

Clusters began to form in different areas of the studio, some groups mostly sat, others alternated, and others stood as much as they could. Some people took the challenge up to two weeks.
Gravity Profile
The gravity profile is a user profile page for members of the 10/60 movement.

In this scenario, Sara K. has downloaded the 10/60 movement app. The peaks in blue represent her movement for April 22nd - quantified as “Gravity Points”. The white peaks represents her daily average movement thus far depending on the time of the day.

Gravity points is the total of daily movement + challenges completed.

By dragging the white circular button through a history of dates, the avatar and graphical chart changes to display the movements for each respective day in the past.

Gravity Feed
Her gravity feed is a list of videos/activities of movement ideas that she has either liked, shared or participated in. To the right of each activity is a summary of it along with the user who created the idea.

Upload an idea
Gravity Profile

Using smartphone features, such as the accelerometer and GPS, the app tracks daily motion of individuals as long as he/she is carrying the phone.

The pencil icon allows for editing capabilities of the data. For example going for a jog without the phone can later be recorded onto the app.

The tracking itself is not intended to be 100% accurate, rather it is a tool for reflection and accountability. How much a person moves throughout the day directly affects the well being of their avatar. The avatar either gains weight or gets older to reflect the frequency of sitting disruption and active movement.

The visual layout is simple and clean, displaying only what is necessary, and the interaction is kept simple. The tracked data includes both an avatar visualization and a graphical data that goes into further details of the time of day that certain activities took place. The graph matches the color of the avatar, in this case blue, to display how much movement, equated as gravity points, occurred throughout the day. The white graph is the running average.

The screenshots above provides an example of the avatar fluctuation and graphical data points to showcase that Sara has moved more on April 22nd than April 21st.
Leader Board

Some users mentioned that they would be motivated if they could have private competitions among their close friends. The leader board emerged to serve as a positive community of supporters and motivators within one’s inner circle.

The above screenshot depicts the total gravity points achieved on April by Sara in comparison to her friends.

A swipe left showcases previous months between the friends. Each person’s avatar also changes their weight or age depending on the fluctuations of gravity points.

These monthly views encourage positive reflection among different networks.
Challenges
Friends from 10/60 can send each other challenges that they find interesting from the main idea library. When a challenge is received, the tab has a little red dot displaying the number of challenges.

When that tab is pressed, the above screenshot appears. It includes a message from the friend and the video/image file that explains the challenge. Beneath this is the duration for task completion set by the friend and then the option to accept or reject this challenge.

Messenger
When we accept or reject, there is a messaging component where we are able to communicate our thoughts about the challenge with the friend. This communication component was designed after learning that being able to send supportive messages to friends made it easier to become more committed.
Movement Reminders

Often time flies by faster than we imagine and based on the interviews, people tend to become lost in the digital world. And thus this component of the app enables people to receive a reminder when the phone has detected inactivity.

Within these alerts, personalized messages can be written in a voice that fits each individual.
1. The 10/60 app detects when Sara has been sitting in the same place for over an hour.

2. It sends her a friendly reminder for her to move, represented by an avatar and a personalized message she has created.

3. Sara gets up and takes a 10 minute break to grab some tea.

4. Before going back to work she checks out the 10/60 website’s featured movement. Sara gets inspired to stand and work outside.

5. She asks two of her colleagues to help her document this idea to share with the 10/60 community.

6. Sara’s idea is uploaded to the 10/60 community where another person has found it interesting and sent it as a challenge to a friend.

The final concept video can be viewed at: https://vimeo.com/67691302
Below is the scenario outline of the video.
Personal Reflection

This experience of doing a masters thesis was quite challenging. What helped me the most in enjoying the process was my belief in the project. The sitting disease is a huge issue and is something that I wish to embrace beyond the walls of UID. I pushed my boundaries as a designer in terms of identifying a large societal problem that has not been properly addressed. In addition, learning how to design for behavior and motivational design, something that is not frequently covered in design academia.

It felt like a lot of constraints were placed upon our class this year. For example, the time constraints of presenting an earlier Design Talks, pushed the scheduling to be at a more hectic pace, there was no proper breathing room between the term project and thesis work. The experience of learning from others is as much of the journey as the journey itself. However, with a large class size, each checkpoint presentation took a week of project time to attend. Under these circumstances, I felt that the situation was handled as properly as it could have been.

The writing of this thesis report took a lot more time than had originally anticipated. Because of the subject matter, condensing the desk research into layman language was exhausting but a worthy challenge.

My scheduling time these past couple of months was split between working and rock climbing. I made sure I slept a proper 8-10 hours each night and ate three meals a day. However, the past few weeks, the pace has picked up and working endlessly on a challenging topic has truly worn me out.

Project Reflection

The movement workshop was essentially multiple workshops condensed to one. Even though alot planning was evolved, it was difficult to document, bake, prepare, while facilitating and receiving feedback from 10 participants. Fortunately, because the majority of the workshop required people to stand and move, it was easier to keep them focused on the tasks demanded. That in itself was a success.

Lo-fi user testing proved again to be amazingly important. The faster I was able to sketch a concept via paper and pen, the faster I was able to receive feedback and move on with relevant elements my concept.

Explaining the concept to different people throughout the timeframe, allowed me to think through what were relevant objectives of the project. Sharing the idea aloud helped me refine the eco-system in a more cohesive story.

Many times I was tempted to go down the route of a physical object as a solution. It would’ve saved me more time in terms of design and strategy around how it could fit in a user’s life. However, being the person that I am, it was hard for me to provide a solution that was not suitable for the real problem. This sitting disease is a societal issue, and until we change our perception of how we wish to live and work - no single product will solve the problem.

Being able to use UID as a testing ground was a perfect scenario because of its atypical setting. Situated so far up north, weather, amount of sunlight, temperatures played a big role on people’s activities. For example, the cold weather and darkness made it less desirable to take outdoor walks. It is filled with dedicated design students who work long hours. In addition, every individual has the luxury of a standing desk, something that I will definitely invest in after school.

Using UID to experiment proved that there is no single solution that can work for every location. However, through trial and error, solutions can be adapted and customized to better suite a situation. It was great to have such a creative environment to prototype upon. The hope is that 10/60 could help facilitate these types of communities.
Museum

Websites


Books


VanPutte, C. L., Regan, J. L., Russo,
REFERENCES


Journals


Katzmarzyk, P., and Church, T., et al. (2009). Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer. American College of Sports Medicine, pp.999-1005.


Videos


Interviews


**APPENDIX A**

<table>
<thead>
<tr>
<th>TIME</th>
<th>Sat</th>
<th>Stood up</th>
<th>At least 10 min of movement</th>
<th>Laid down</th>
<th>ACTIVITY (Sleep/Work/Eat/Exercise/Toilet/Break, etc)</th>
<th>NOTES/ACTIVITY DESCRIPTION (mood, type of food, type of exercise, emotions, etc)</th>
<th>TIME</th>
<th>Draw level of tiredness experienced throughout the day</th>
<th>Comments</th>
<th>TIME</th>
<th>FEELING</th>
<th>DRAW LEVEL</th>
<th>TIME</th>
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**DATE:**

How do you feel physically today? (Circle)

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<tr>
<th>Tired</th>
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<th>Energetic</th>
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How do you feel mentally today? (Circle)

<table>
<thead>
<tr>
<th>Tired</th>
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<th>Fantastic</th>
</tr>
</thead>
<tbody>
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Did you experience anything different from your typical day?

Please describe how you felt overall today (your high and low moments of the day) and why.

How did you sleep LAST NIGHT? (Circle)

<table>
<thead>
<tr>
<th>Poorly</th>
<th>01</th>
<th>Very Well</th>
</tr>
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**NOTE:**

Feel free to track another emotion or state below

DRAW LEVEL

**APPENDIX A**

How did you sleep LAST NIGHT? (Circle)

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**NOTE:**

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DRAW LEVEL

**APPENDIX A**

How did you sleep LAST NIGHT? (Circle)

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**NOTE:**

Feel free to track another emotion or state below

DRAW LEVEL
Why do you SIT?

Emotional responses: Feels good, relaxing, to have clarity of thought.

External factors: social structures, desk and work requirements

Why do you MOVE?

Destination reasons
Goal driven reason
Biological reasons

Enjoyment/explorative reasons
Exercise reasons
Design Process of Website and App Creation

WIREFRAMING
During the ideation stage, many ideas were clustered into an ecosystem based on how it served the user experience (home, work, societal perspective). This ecosystem served as the main inspiration for how the website was to be laid out.

Popular video sharing websites, such as youtube, vimeo, infinity list as well as popular image feed resources such as pinterest, flickr, dribble were evaluated for commonalities and information architectural styles that suited to a broad spectrum of users in a simple manner.

Some common video related actions included, “liking” a video, sharing a video, and commenting were included in the wireframes.

Very lo-fidelity wireframes were made to get an idea of possibilities of how the website can be housed.

These wireframes were spiced up and presented as storyboard walk throughs to different users for clarity in user interface.

The website were sketched on white A5 paper and the app was sketched in A6 green paper.

Lo-fi wireframes made users feel comfortable and more open to sharing their opinions.

This user sketched over several website screens and app screens to point out areas that were confusion and areas of opportunities in terms of information hierarchy and icon usage.
The second user did not own a smart phone. This presented a large area of opportunity to explore how the website can also reach this population in a meaningful way when the app is not a possibility.

The data collected of how much a person moved was originally visualized as a 24 hour circular graph, but this chart was unfamiliar to read for many of the users. Four out of the five preferred the normal x-y diagram.

The third user spoke about how important it is for him to do very little with the app. He gives an example of POVIO, a simple application that updates friends on their current activities.

The fourth user mentioned that she can easily inspire her friends through positive reinforcement and supportive comments. She did not own any social network account so the element of personal communication was very important for her.

As each iteration was made, the concept became more clear. The last user was able to add the icing on the features of the smartphone app. She mentioned how she does not often carry her phone when she exercises such as going for a jog or the gym. Editing data definitely something that was necessary for these types of moments and thus was implemented.

**ITERATIONS**

After each user test, changes to the lo-fi sketches were made until an optimal solution was reached.

Whiteboarding the ideas and user feedback helped improve the wireframe sketches in between iterations.
WEBSITE FEEDBACK

Further feedback was received from various users to see if the website’s user interface was clear.

Simplicity without confusion

Creating a simple layout was the original goal with the website. However, although simple, the version to the right proved to be a bit confusing in terms of what was a selectable item and what was not. Three frequently encountered user feedback included:

1. Icons vs. Buttons
   The navigation buttons were confused as embedded icons associated with the main image as oppose to buttons on their own.

2. Purpose of Central Image
   The purpose of why the main image was bigger than the rest was unclear - was it clickable or just informative?

3. Information Architecture
   The overall look was too simple and made it difficult to gauge from the images what was worth clicking further. Descriptions of each idea was needed to provide more context about each activity. Additionally, the margins between the images made it overwhelming and difficult to read each image as different ideas.