T W O
T I M E

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Individual Report
Logbook and Material Response

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Introduction

As three-dimensional beings stuck in four-dimensional space, it was our awareness, and sharpening of, this predicament that made salient the scarcity of time in 'our lot(space) in life'. A prime mover of the human condition, the passage of time was something painfully consequential but determinedly out of our control. Hence through the act of measurement, we sought to fabricate the illusion of authority, with sundials, water clocks, and hourglasses. As we began to track its passage, dividing it up into the discrete values of hours, minutes, seconds, with exacting accuracy, we have organized lives and societies around a notion of a 'public' and widely-held view of time. Despite a collective "objective" view of our shared velocities through time, our perceptions of this temporal locomotion tend to differ given across individuals and task at hand, a 'private' time if you will. With perception colouring our view of reality, this subjectivity in time perception is at an impasse with the apparent "objectiveness" of the exacting hour, minute, and second, as represented with sequential digits(stemming from mathematics). This dissonance between the 'private' and the 'public' view of time calls into question the act, nature, and purpose of timekeeping. Despite its innumerable benefits to society, it has indentured its creators, us, into servitude as even as we imagined authority over it. Despite its function in moving the human collective forward, on an individual everyday level, we live in accordance to its passing, moving from one task to the next, conscious of its passage, no longer qualifying as human being but human doing[1].

It's time to take back our *time*.

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[1] Allegedly by Kurt Vonnegut.

Artefact Analysis

To begin this effort, I looked to a timekeeping device I was familiar with for an **Artefact Analysis**. The history of the artefact in question illustrates the necessity and operation of time-keeping devices in one particular feat of human ingenuity, aviation. Relatively exploratorily in nature, I also examined the history of the artefact alongside its function as both a time-keeping device and symbol in and out of its context of use, historical or otherwise.

Stowa Flieger B-Uhr Type-A Classic 40

Figure 1 & 2: From Stowa's Official Shop / The same watch from my collection

Material

1. Metal
2. Glass
3. Plastic
4. Leather
5. Other

It is a tool for time telling you wear on your wrist, a modern interpretation of the pilot watch; steeped in history and made to the individual that is unlikely to use it in the specific scenario it was designed for. Cold and weighty for its diminutive size, it has a bearing of reliability; not surprising as it begin life as a wearable for pioneering pilots that found it a hassle/danger to fish out palm-sized pocket watches mid-flight. It is comprised of three main sets of components, the watch body, movement and face.

Hard-edged and utilitarian, the body of the watch is comprised of four main parts, beginning with a machined round stainless-steel case with an all-over uniform brushed polish with 20mm cushion lugs. Next, a see-through caseback comprised of stainless steel and sapphire crystal, etched into the steel in a circular pattern are the phrases 'SAPPHIRE CRYSTAL', 'WATERPROOF 5ATM', 'MADE IN GERMANY', 'STOWA. SINCE 1927', 'FILEGER AUTOMATIC', 'STAINLESS STEEL', the caseback is bolted down to watch case with 6-flathead steel screws. Next, the front of the case is covered by a single piece of mildly–domed sapphire crystal, underneath is the watch face and hands. The last component of the watch's body is the flattened 'onion' shaped crown cut with deep groves which affords gripping and turning, the crown allows for the hand winding of the movement, and when pulled out with an audible 'click', it allows for the adjusting of watch hands via turning in a clockwise or anticlockwise direction. The watch case is accompanied by suitable 20mm spring bars for the addition of 20mm watch straps.

From the crown is attached a stem that serves as a bridge between the user's input and corresponding action in the watch's complex movement. The ETA 2824-2 is swiss-made 25.6mm wide, 4.6mm thick, hacking(second hands stop when pulling out the crown), hand windable and mildly-antimagnetic watch movement with a power reserve of 38 hours, comprised of 17 jewels(synthetic rubies that reduce friction) created and sold by the Swatch group, it is a careful assemblage of meticulously crafted parts, some silver, some gold-plated, some temperature-blued steel, with varying styles of polish, held together with screws and engineering, powered by kinetic energy(moving the rotor or winding the crown) which powers a movement that beat at 28,800 vibrations per hour. As a simple automatic movement with no further complications, it comprises of the core components of a *stem* and an engraved and weighted *rotor*(which captures an individual's kinetic movement) attached to a *mainspring* which stores captured kinetic/potential energy that is released to the *escapement* and transferred to the *gear train* while regulated by a ticking(with accompanying noises) *balance wheel* which controls the advancements of the *gear train* as it powers the gears in the *dial train* which ultimately powers the movement of the watch hands which in turn provides information by tracking the passage of time. Stowa has chosen to embellish its movement

with different variations of polish and engraving on various watch parts. The make, model, brand, movement type and serial numbers are engraved on the back of the watch's rotor.
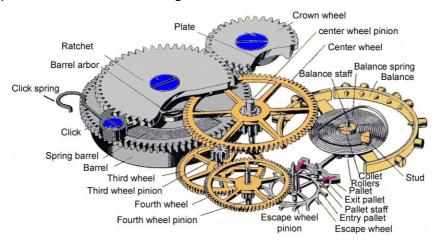
Figure 2 – From Ermitage Chronicles: Basic Movement Components

If the movement is the heart of the watch, its face, well, is its face. The watch face provides information 'created' from the confluence of kinetic energy and human ingenuity. Copiously sterile there is no branding on the dial but instead, it adheres to its pilot heritage with a matt black dial approximately 38mm in diameter with legible white printed markers(of different lengths and thickness) and Arabic numbers with applied Superluminova C3 for visibility in dimly-lit conditions. An exception to the ring of Arabic numbers is the absence of the number '12', replaced by an orientation triangle (a triangle pointing upwards with two dots one on its left the other on its right, placed between the vertex and base of the triangle) that allows for certainty of the watch's orientations and thus glanceable readability of the watch face in any conditions. Above the face are three watch Superluminova C3-applied hands (Hours, Minutes, Seconds) each of a different design with a unifying theme, attached to the dial train. Furthest from the dial is the Second hands a thin streak of white with a temperature-blue steel counterbalance; at 28,800 bhp, it gives of an illusion of smooth motion with its passage between each thin marker on the dial signifying the passing of a second and a full revolution signifying the passing of the minute, moving the Minute hand correspondingly to the next marker. The Minute hand is a trapezium or two isosceles triangles of unequal length of which its Superluminova C3 centre is outlined by temperature blue steel abiding by the motions of Seconds hand, it moves from marker to marker with the passing of each minute, a complete revolution signifies the passing of an hour corresponding move of the Hour hand. Lastly, nearest to the dial is the Hour hand shaped as a reduced version of the minute hand it likewise abides by the motions of the Minute hand, moving from marker to marker with the passing of each hour, a complete revolution signifies the passing of an hour.

Where is it from?

My personal history with this particular piece stems from an arranged in-person purchase enabled by Reddit and executed somewhere in New York, however, its style has a long and sortied history. Of which is covered in the Historical excavation.

When is it from?

This piece was made in modern times but inspired by historical precedent while also being made obsolete by the advancements of watchmaking and timekeeping. The historic ideal of the pilot watch harkens back to the first few manned heavier-than-air flights where one enterprising pilot mention that it was a hassle to use his pocket watch while in air. With its German roots, the popularity of this style is attributed to Adolf Hitler's directive to German watchmakers to design a suitable standard-issue watch for his fighter/bomber pilots.

Who used it? List reasons you think so.

Now, watch aficionados and I have used it in capacities it was not designed for. However, its particular design language of clarity and legibility at arm's length was critical to pilots and any others whose line of work/task-at-hand necessitated the use of both hands and a scant amount of spare attention.

What was it used for? List reasons you think so.

Historically, it was used for pilots to track the passage of time/distance, the fuel in their tanks, and for the lack of a compass, true north, amongst others. Its widespread use may result in it becoming a badge of honour/recognition/identification amongst pilots of old.

What does this tell you about the people who made and used it?

On the people to made it, they were making it to meets the needs of a specific user group under Hitler's command. To the people to use it, its utilitarian watch face signalled what they needed while in flight and fight – readability at a glance.

What does it tell you about technology at the time it was made?

Drawing instead from when the first pilot watches were made, it tells me that at that time, manufacturing/engineering was significantly advanced, but limited by the paradigm of the times for knowledge of the material sciences and the corresponding quartz/tuning fork watches was not

realized yet. In modern times, such watches are signifiers of style and taste for there are other devices more apt for modern time-telling.

What is a similar item from today?

On functional the time-telling front, it could be any watch be it the quartz, smart or the one you have in your smartphone, mechanically it could resemble any complex construct of parts to fulfil one specific purpose, aesthetically it is a signifier of taste, a conversation piece and an acceptable piece of male jewellery.

Historical Evidence

With information widely available online on its storied history, I primarily referred to the articles below

- https://monochrome-watches.com/history-of-the-pilot-watch-part-i-cartier-santos-1904/
- https://monochrome-watches.com/history-of-the-pilot-watch-part-ii-zenith-montre-daeronef-type-20/
- https://monochrome-watches.com/the-history-of-the-pilot-watch-part-iii-mark-iv-a-and-mark-v/
- https://monochrome-watches.com/the-history-of-the-pilot-watch-part-four-longines-and-lindbergh/
- https://monochrome-watches.com/the-history-of-the-pilot-watch-part-five-b-uhr/
- https://www.stowa.de/en/Fliegeruhren/

The very existence of the pilot watch is intertwined with the notions of aviation and war. From meeting the needs of the very first airmen to those of pilots in the golden age of aviation and those fighting for their country and beliefs. Various brands, Cartier and the Cartier Santos, Zenith and the Zenith Montre d'Aéronef Type 20, IWC and the Mark IV.A/Mark V, Longines and the Hour Angle Watch, and finally the (mostly)German Stowa/Laco/Lange & Söhne/Wempe/IWC and the B-Uhrs. For brevity, I'll be focusing on the German advent of the pilot watch.

Made initially at the behests of Adolf Hitler and to be issued to the Luftwaffe in preparation for war, the first B-Uhr were watches of 55mm to accommodate the size of hand wound movements typically used in pocket watches. Designed for reliability and accuracy, pilot watches were to be anti-magnetic and capable for hacking, for preflight time synchronizations, when pulling out an oversized onion crown designed to be used with gloves. Their size resulted in impressive legibility and its accuracy proved indispensable when paired with navigational charts. There were

two versions of the B-Uhr watch face with the [Type-B](#) dial possessing an inner chapter ring absent from the Type-A dial.

The modern interpretation which I possess is much smaller and the addition of a weighted rotor allowed for automatic winding alongside manual hand winding, the design of the watch case/crown has seen minor modern refinements and the watch face has remained practically unchanged since its inception. However modern rehashing of historic designs will be unlikely to serve its functional purpose of aviation but instead be used for its aesthetic appeal.

Creativity Templates

Anchored by a modern interpretation of the Type-B pilot watch as the artefact in question. I started to break it down into its functions and components to discern its purpose and qualities and apply the **Creativity Templates of, Remove, Replace, Redefine, and Relationship** to it. Seeking means to rethink how the wristwatch, the very symbol of time's oppression, can be used to inform a means to break the shackles it perpetuates.

Components

- Watch Case
    - Crown
    - Caseback
        - Caseback's Sapphire Crystal
    - Lugs+Springbar
    - Sapphire Crystal
- Watch Face/Dial
    - Orienting Triangle
    - Arabic Numbers
    - Applied Superluminova Lume
    - Watch Hands
        - Hours hand
        - Minutes hand
        - Seconds hand
- Mechanical Watch Movement (ETA 2824-2)
    - Winding Stem
    - Automatic Winding Rotor
    - Mainspring

- o Balance Wheel + Hairspring
- o Escapement
- o Gear Train
- o Dial Train
- o And much more

Features

Mechanical Time Keeping

The artefact is at its core, a mechanical watch, traditionally a tool for timekeeping. It does so by capturing kinetic energy from its user converting it into potential energy to be stored in the mainspring. This energy will power a mechanical movement regulated by a balance wheel/hairspring to move the watch hands at a pace based on widely agreed-upon measures of time.

Art, Ornamentation or Jewellery

The artefact is also an article of fashion, hence could come to mean several things. As a piece of wearable art it could be a statement piece, an outward signifier of the wearer's tastes and sensibilities, appreciation of its provenance and associated histories, belonging to a group, or it might be an heirloom or commemorative piece that represents an ancestry, memories of inward significance to its wearer.

Remove – Redefine the Passage of Time

Seconds and Minutes hand OR Hour and Minutes hand (and anything else in between, but that would serve no purpose)

As the 'Hands' component of a watch is made out of three watch hands, Hours, Minutes, Seconds that track different increments of time, removal of one or two hands would in a way reduces the granularity in which time can be kept and interpreted by a user.

Figure 3 – Watch Seconds and Minutes hands removed

In the first scenario, applying such removing the Seconds and Minutes hands will leave the Hour hand in the watch, decreasing the accuracy of time that can be discerned, leaving the user with approximate knowledge of the hour and minutes in that hour and eliminating knowledge of the seconds in the minute. Due to imperceptible movements of the Hour hand, the illusion that time has slowed down or come to a standstill might be created; this engenders users to worry less about the passage of time, enjoy the moment and be possibly be late for all appointments for they live in their own time.

Figure 4 – Watch Hours and Minutes hands removed

In the next scenario, applying such removing the Hours and Minutes hands will leave the Seconds hand in the watch, eliminating the measurements of Hours and Minutes, leaving the watch only capable of tracking the smallest increments of time in the seconds, harkening back to the

functionality of a minute-long hourglass. Besides making the watch mostly useless for most users, the constant movement of the Seconds hands may engender in the user the notion of time passing but with no means of tracking the elapsed time. This may accentuate the very human fear of 'time running out'.

The above designs might be a niche product that encourages individuals to rethink how they interpret time, besides being a piece of critical design that engenders reflection on one's perception of time it has significantly less utility for time-keeping than of a typical watch.

Replace – Past and Present

Figure 5 – Watch with paper Gnomon attached

Replace Hours hand with Sundial Gnomon

Harkening back to the original means to time telling, the Sundial told time based on the shadows cast by the Sun. The Gnomon is the 'fin' which typically extends from the centre of the dial to noon and serves at the obstacle in which sunlight is blocked, casting a shadow that fell onto a dial telling the approximate hour. However, due to Sundials being primarily stationary objects on level surfaces that required expertise to both setup and read from, the replacement of the hour hand with a Gnomon is not an adequate substitute for the Hours hand in terms of accuracy of time read.

This might be related to the removal template. Evidently, a sundial and a wristwatch is not a good mix due to competing requirements for accurate use and hence this design will have little time-keeping utility for users.

Redefine – Mild Increments in Usefulness

Figure 6 – Watch with dial removed and replaced by a mirror surface(simulated)

Watch Redefined as a Mirrored surface

As literal as it gets, replacing the matt black dial with a mirror increases the functionality of the watch, making it both a time-telling device and a handy-dandy wrist mirror. However, the watch face might be too small to be used as a mirror and will likely serve to accentuate attention afforded to the watch. The mirrored surface may also negatively impact the watch's legibility, especially in sunlight. Even as a mirrored dial adds to the watch's overall functionality, the increment in usefulness is minor at best and hence is not appropriate for most users.

Relationship – Comic book magic and un-realistic applications
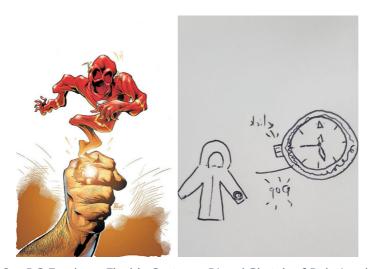
Figure 7 & 8 – DC Fandom: Flash's Costume Ring / Sketch of Relationship template

Sample Dimensions: Legibility/Readability, **Water Resistance**, Anti Magnetic, Time Telling, Weight, Inaccuracy, Maintenance, etc

Taking the hardiness and water resistance of the pilot watch literally while also ignoring the basic principles of physics with a liberal dollop of advanced material science, I thought a water-resistant watch can share this attribute with its user on command. In principle, it works similar to the Flash Ring in DC comics, storing a compressed raincoat in a part of the watch, ready to be deployed when needed.

I see no reason why this is even possible at all but if possible it is slightly useful, after all, who doesn't love to have a portable raincoat on your wrist for inclement weather?

Interaction Relabelling

Another creative method employed was the act of **Interaction Relabelling**, in where the attributes of the artefact are superimposed onto another object. In this case, I found the close relationship between time and memory and hence sought to attempt relabelling the components and features of time telling of the very custodians of memory, the (pre-digital) film camera.

Functions of a Watch

1. Mechanical Time-keeping
2. Ornamentation or Jewellery
   a. Heirloom
   b. Mark of belonging/identity(to a group)

Components of a Film Camera

1. Camera Body
   a. Shutter
      i. Shutter Release
      ii. Shutter Speed Control
   b. Film Advance Lever

       c. ISO Controls

       d. Light Meter

           i. Light Meter controls

       e. Film Rewind Knob

       f. Camera Door Release

       g. Viewfinder

           i. Mirror

           ii. Pentaprism

       h. Flash Shoe

       i. Lens Release

2. Lens

       a. Aperture

       b. Focusing Ring

       c. Aperture Diaphragm

       d. Aperture Ring

Relabelling – Functions of Mechanical Pilot watch on a Film Camera

A film camera takes photos by exposing light onto film. The amount of light is controlled by the duration the film is exposed and the amount of light allowed through the aperture, of which both are controlled by the aperture diaphragm controls and shutter speed controls respectively. A user mainly operates the camera through interaction with the shutter release, film advance lever, film rewind knob, on the camera body as the use of these parts of the camera emits significant levels of sound I will use them to maps the various watch components central to time telling onto them. Due to the complexity ETA 2824-2 movement, I will limit my relabelling to the signifiers of time telling components.

- Winding stem/Rotor = Film advance lever
- Watch Dial = Sound emitted by the camera
- Hours Hand = Film Rewind Knob
- Minutes Hand = Shutter + Shutter Release
- Seconds Hand = Lens Aperture Ring + Aperture Diaphragm
- Regulator + Hairspring = Camera Controls (Shutter Speed + ISO Controls)

For a film camera to measure time and store kinetic energy the way a mechanical watch does significant adjustments will have to be made which I will not elaborate on due to the need for brevity. Operation:

1. As a means to capture the kinetic energy to power the camera, a user will have to constantly pull the film advance lever to winds a 'mainspring' till it is fully wound, ideally, 24 times with each pull powering the camera for an hour.

2. The user then presses the Shutter Release to set the camera into motion to track the passage of time, this represents the 'hacking' nature of the watch. The Shutter Release remains depressed.

3. This will cause the aperture, typically stepped, to count the seconds by 'ticking' down from its maximum value to its minimum value. This 'ticking' happens over 60 times, each time it 'clicks' a second is passed.

4. When the Aperture Ring reaches its minimum value, the Shutter, which tracks minutes will fire audibly this signifies that the passing of a minute. This cycle repeats 60 times.

5. After the above cycle has repeated 60 times, the film rewind knob will be engaged and 'wind' by the 'film' once, the sound this emits represents the passing of an hour. With each advancing hour the film rewind knob 'winds' back a double, triple and so on till twenty-three additional increments, signifying the competition of this cycle and the passing of a day.

6. Once the Camera is out of 'power' the Shutter Release will return to its original position signifying that the camera has to be 'wound' again.

7. One and use the camera controls to adjust the duration the camera recognizes as a second, minute, and hour.

Extreme Characters

The last creative method deploy is designing for **Extreme Characters.** In this case, I began to explore one's access to time, by looking into how the vocabulary of *reading* the time privileges sight and prevents access of the differently-abled to a "mastery'" over their time. The next extreme character was subject to the nature of designing a time-keeping device that 'recognizes' how an individual's task-at-hand affects their perception of time. I'll note one of the constraints I have set for myself is to keep the designs as mechanical as possible in an attempt to stay true to the spirit of mechanical movement of the artefact.

Extreme Persona 1 – A Blind, Pro-consumerist, watch collecting Zen Practitioner.

The artefact is a watch, referring to an object, but the word 'watch' is also an act of looking that implies the sense of sight, however, this design is not inclusive as it does not allow the use of other senses to discern the passage of time. Designing for the persona of a 'Blind Zen Practitioner' helps consider the sensing of time through touch.
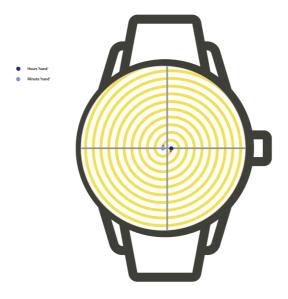
Figure 8 – Sketch of Extreme Persona 1 Mockup

Profile/Attitude towards time-keeping

In the spirit of exploring how sight is all too often tied to the act of reading time. Upon the discovery of Eone's [Bradley watch,](#) I felt it necessary to rethink how we 'read' time, designing watches in a way that are more accessible to those differently-abled. Considering the paradoxical nature of a 'Pro-consumerist, watch collecting Zen Practitioner' was a means for me to shoehorn in both the planned design of having the watch face modelled after the waves of Zen garden while also giving this 'Zen Practitioner', who is oddly attached to time, a cause to own such a frivolity.

Concepts: Tactile time read differently.

The appropriate watch for the above persona is a piece that can be read by touch. With the dial made out of two parts, first a skeleton of stainless steel with groves in the shape of a double spiral with horizontal and vertical bars bisecting the frame in 4 even portions, next it is overlaid with hardy stretchable fabric to protect its inner mechanisms.

Reminiscent of a Zen garden, the hours and minutes 'hands' are tactile nubs that lie under the dial with directional arrows that move outwards to the edge of the dial in a 12 hour period, reversing inwards once both have arrived at the furthermost edge of the dial at noon and midnight respectively, upon which they rotate their directional arrows and retrace their path back to the centre of the dial. Reminiscent of the cycles of a day and one's breath.

However, this unconventional tactile means of reading time may lack accuracy but even so, it was not designed for accuracy to begin with. Given the persona of a Zen Practitioner' may have a looser view of time, this artefact's interpretation of time with practice allows a unique means of interpreting time that is accessible to all.

Extreme Persona 2 – A Buddhist Monk

Buddhist teachings about time have often considered one's perception in its interpretation, utilizing their units of measuring time. This cynical view of time may seem incongruent with the notions of a steadily ticking watch but the below design attempts to capture altered states of mind when engaging in meditation, a typical Buddhist practice.
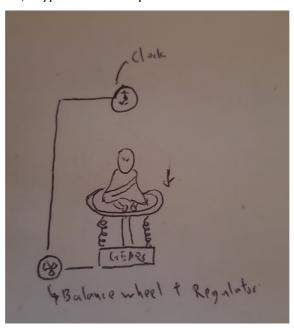

Figure 9 – Sketch of Extreme Person 2 Mockup

Profile/Attitude towards time-keeping

Meditation occupies much of a Monk's daily routine, which is set according to a strict schedule. With meditative states altering one's perception of time, I sought to design a device that *stops* when one is engaged with meditation.

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The timekeeping device would be one powered by an individual's weight as they sit the platform that houses the mainspring. The weight of the individual meditating will depress the platform winding the mainspring in the process. When the individual leaves the platform this stored energy will then be converted into kinetic energy that powers a clock in the same manner kinetic energy is utilized in a wristwatch that retroactively tracks the time elapsed during or 'energy accumulated' via one's meditation.

Reflections and Moving Forward

Amongst the creative reimaginings, I found the strongest and most feasible concepts lies in those created via the creative templates, especially the **removal** and **replacement** templates. For interaction relabelling and extreme characters, I could assemble a hypothetical plan to reimagine a watch as either relabelled to a camera or designed for either extreme character. However, I was certain of my lack of technical ability to execute on it, considering the prototyping tools we are utilizing. It's interesting to consider that the design of the *A Blind, Pro-consumerist, watch collecting Zen Practitioner* persona was largely inspired by an existing product of Eone's [Bradley Watch](#) and this has taught me to consider access in designing for a time-telling device, for most times we take the act of 'reading time', which privileges sight, for granted. Furthermore, the 'Buddhist Monk' persona had me consider the deeper philosophical implications of time perceptions and the recognition of its passing, in part, this also draws on(for the lack of deeper reading into meditative practices) of the time-altering nature of immersion and flow.

I'm convinced that the idea of creating a prototype wristwatch is not feasible due to the nature and size of the prototyping tools. With that in mind, I considered the **'Replace – Past and Present'** template with a gnomon attached in place of the hour hand to a watch head on a rotating dais illuminated by a light source, with the resulting change in angle of the gnomon reflecting the passage of the hour, now divorced from the gear train that moves the minute and seconds hand.

Figure 10 – Envisioning the Watchhead + Gnomon with a light source and shadows

Although mostly an idea in mind space and not even on paper, I felt this design, as outlandish as was incorporated the history of timekeeping into a piece of critical design that allowed a degree of control over the 'speed' of time in controlling the speed in which the dais rotates, this amongst other considerations of variable perceptions of time added to the mix the areas of consideration that built towards the design of the final prototype.

This was slated to change quickly and drastically.

New Statements of Design Intent

After the completion of the individual components of **Artefact Analysis, Creative Templates, Interaction Relabelling,** and **Extreme Characters,** I worked with Cheryl to dream up new statements of design intent, coming up with our individual statement before combining them both.

Sean's Statements of Design Intent

1. I want to protect humanity from the passage of time
2. I want to protect time from humanity's hand
3. I want to protect access to time telling
4. I want to protect other human senses from the inability to tell time
5. I want to protect mindfulness from being affected by time
6. I want to protect (the physicality) mechanical ingenuity from electronic uniformity
7. I want to protect the means of energy conversion from route understanding

Cheryl's Statements of Design Intent:

1. If artefact is a reimagined film camera, i want to protect film cameras from becoming a thing of the past
2. If artefact is for the hunter, i want to protect the hunter from getting injured
3. If the artefact is for the priest, i want to protect his followers from being ill
4. If the artefact is a bezoar stone in its case, i want to protect the stone from getting scratched
5. If the artefact is a reimagined child's playtoy, i want to protect the children from playing with other toys that might be harmful to them
6. If the artefact is in its holder, i want to protect the stone from rolling away
7. If the artefact is a reimagined film camera, i want to protect unaware subjects from illegal/unethical photography since a click sound will be made when a photo is snapped

Combined Statements of Design Intent:

1. I want to protect film cameras from becoming a thing of the past. I want to protect (the physicality) mechanical ingenuity from electronic uniformity.
2. I want to protect the multifunctionality of a wearable from its single functional nature.
3. I want to protect children from a singular view of time.
4. I want to protect private perspectives from public perspectives.
5. I want to protect the tool for time telling from external forces.

Final Statement of Design Intent:

"We want to protect the **knowledge of time**[2] from **external forces**[3] because it's important that one **develops their own view of time**[4] external from the **public's perception** of it."

New Creative Methods

Removal Template – Remove the watch strap

Watches are normally worn on one's wrist, but when you remove the strap, users will be made to place the watch head elsewhere (ie. in their pockets, or a designated pouch), hiding their

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[2] Ways of knowing/doing.

[3] Extraneous influences, social conformity, social pressures of how time is to *be* understood.

[4] One's own view of time passing separate from the public view of time passing.

'time' from the view of others hence protecting their prediction of time from "external forces". As per the initial methods of use associated with its predecessors, assuming the role of an inconvenient pocket watch after the removal of its strap.

Replacement Template – Replace 3 watch hands with 4 or more watch hands

Based on a GMT watch, which is a mechanical complication that allows a user to read time up to two different time zones, accurate to the hour, which is coincides with the accuracy in which time zones are demarcated. In this case, the two time 'zones' are separated into a 'public' and 'private' perception of time. Given this feature it also has ties to the histories of the pilot watch with the Glycine Airman, a pilot watch itself, being the first interpretation of the complication and the Rolex GMT Master being the 4-handed version of it[5].

Most wristwatches have a 3-hand system(Hours, Minutes, Seconds), which are regulated based on time as per public perception. However, with the addition of the 4th or more hand(s), that additional hand(s) could stand to represent the user's own perception of time, decipherable only by the user itself. This differentiates between public & private perception of time, as per our design intent.

The additional 'hands' can be executed in tandem with the original three-hand system, depending on the degree of accuracy desired, this can be achieved by '*slaving*[6]' the additional hour and/or minute hand(s) to the main 'Public Time' movement. Via the use of a mystery dial[7], a user can have a discreet view of his/her own time without the awareness of others[8]. Furthermore, as an aesthetic choice, the dial can be composed of the material Vantablack[9] for added visibility and discreteness.

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[5] https://wornandwound.com/complications-gmt-world-time/

[6] *heh slaving*

[7] https://wornandwound.com/complications-the-mystery-dial/

[8] Is this really necessary?

[9] Vantablack watch (warning v trippy)

Figure 11 – Replacement template mockup

Redefinition Template – Privacy Detector in the form of Touch

The watch will be redefined to be a privacy detector, with the watch's functions only available to its designated user. While the watch face reflects 'Public Time' as per normal, 'Private Time' can only be accessed by touching/squeezing the sides of the watch head. The sensation(haptic feedback) felt will only be decipherable by the designated user itself.

To a certain extent, if there is Bluetooth pairing enabled to Ture Wireless Earphone, sounds can be used as a means to readback time to the user via their earphones, allowing one to "hear time", improving access to the differently-abled. Still, this deviates from the mechanical spirit of the wristwatch.

Relationship Template – 3-FA[10] secured 'Private Time'

Taking the notion of privacy to the nth degree, and incorporating how reading time is a visual activity, we've considered using a three-factor authentication inclusive of, vitals, such as heart rate/blood oxygen as compared to a baseline, fingerprint sensor and retina/face detector to conceal one's private perception of time. This not only makes reading time a very intentional and secure activity but also plays on the relationship that a user has to look(using sight) to read time. By tying this act of looking to 'Private Time'. It is emphasised that privacy and the act of looking(i.e. the knowledge of time) are deeply intertwined.

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[10] Fingerprint, Retina(or Face), Vitals(heartrate), etc

Effectively, 'Private Time' will only be visible when its user is viewing the watch. Only by authenticating the three levels of security will the watch face reveal 'Private Time', otherwise 'Public Time' will be displayed. Though this seems too similar to the redefinition template, it is evident that we were running out of ideas.

Genesis of an Idea – Two Time

We eventually settled the**' Replacement Template – Replace 3 watch hands with 4 or more watch hands**.' We did so considering the nature of prototyping tools, the Arduino mega kit. This interpretation of the design statement stays the most faithful to the proposed notions of 'Public' and 'Private' time with two 'clocks' tracking the passage of each in on prototype. On the prototyping end, we believed the use of motors and gear trains as a representation of a (relatively) mechanical reimagining of the artefact in the form of its predecessor, the clock. We thought this would also allow for a degree of control over the 'speed' of time through a potentiometer affecting the speed of each motor's rotation, and when enclosed in a black popper flax closure box fulfils the criteria of 'protecting' one's 'Private Time' as well. Alternatively, we thought of approaching time with less discrete values, as suggested by one of our interviewed experts. Below follows our thoughts and details on this iteration of the prototype, considering the materials needed and feasibility of each representation of time and its passage.

Defining times

'Public Time' Defined

Clock time, external time, normative time, save minor discrepancies between the accuracy of time-telling devices, it tracks/syncs to time zone specific time as it is understood by a collective agreement, it is recognised[11] that we perceive 'Public Time' in the same manner. We share the same 'Public Time'. Usually represented in sequential, discrete numerical values. We are subject to but have no control over it.

'Private Time' Defined

Your time, internal time, personal time, differs between individuals based on perception and task at hand. Can be represented/understood in any way reasonable to an individual. We have

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[11] Assumption, as much as it is possible

different 'Private Times'. We are understood to have a greater degree, but not absolute, control over 'Private Time', which speed of passing can be altered/manipulated.

Initial Prototype:

1. Defining 'Public' and 'Private' Time, distinguishing between the two.
2. Display/Tell 'Public' and 'Private' Time
3. Manipulate 'Private Time'
    a. Control the speed of 'Private Time'
4. Conceal the knowledge of 'Private Time'
5. Challenge how users view their relationship to each respective times.

Initial Prototype Description:

With the Arduino mega(s) there will be two clocks, one displaying 'Public Time' and the other 'Private Time'. Both clocks will be housed in a rectangular black case made out of hard plastic with a popper flap closure. The Black case containing the clocks will be attached to a camera sling to be carried around, in a way creating a "Slingwatch". Notably, the 'Public Time' clock should be displayed for all to see on its exterior and the 'Private Time' clock should be hidden within.

Initial Clock Prototype variations:

'Public Time' – Accurate LCD Clock (**link**)

This will be a simple LCD clock, that along with perhaps a Real-Time Controller(RTC), could be used to track and display 'Public Time'. A link to the reference Arduino project is attached, note this project does not use a RTC and has to stay on to accurate act as a clock, otherwise it will reset each time it is switched on or off.

'Public Time' – Variable LCD Clock

Same as the above, but there are considerations to how the 'speed of time' is to be varied with a potentiometer, increasing the length of each second hour and minute via a user's analogue input, though this is not yet determined if possible.

'Private Time' v1 – Type A: Variable Motor Clock (Dual motor + No gears)

This will be a slightly more 'mechanical' clock that utilizes 2 motors, one stepper(Hour hand) and, one DC(Minute hand) that when attached with shafts and a clock 'Hand' mimics the

movements of a minutes and hours hand. The 'speed of time', and therefore current, could be able to be varied with a potentiometer.

'Private Time' v2 – Type B: Variable Motor Gear Clock (Single Motor + Gears)

This will be a slightly more 'mechanical' clock that utilizes a DC motor and gear train of teething ratio of 1:60:~~360~~ to mimic the movements of the hours, minutes and ~~seconds~~ hands(Second hand creates too much unnecessary complexity). The "speed of time" and therefore current, could be able to be varied with a potentiometer.

'Private Time' v1 – Type A: LED Lights as Signifier

Instead of using discrete units of time, such as numbers, the concept of 'Private Time' will be more distinguished through the use of LED Lights. Such a signifier makes it so that without a prior understanding of how/what the LED lights signify, there would be no way for 'Private Time' to be read by unintended audiences. This ensures that differentiation between 'Public' and 'Private' Time we hope to achieve.

How this will be interpreted is yet to be fully determined.

'Private Time' v1+ – Extension of Type A added Flicker Interval and LED Intensity

Different modes of flickering of different LED lights to illustrate time, eg. Red LED to signify school-related activities, with the time to leave for school shown with a rapid flickering of the red LED. This came can also be done by varying the intensity of each LED. Different light intensities of different LED lights to illustrate time, eg. Blue LED to signify school-related activities, with the time to leave for school shown with the blue LED having a high intensity. Possibly incorporating both, this design can also consider divulging more meaning through the varying Intensities and brightness of each LED

Initial Prototype Materials:

- 1x Black Popper flap closure Case
- 1x Camera strap
- 2x Batteries (2 9V)
- Some Bluetac
- Some Black/Gaft tape
- Some cupboard

- 'Public Time': LCD clock
  - 1x LCD display
  - 1x Arduino mega
  - 1x Breadboard
  - Many jumper wires
  - 2x buttons (for clock setting)
- 'Private Time': Motor Clock v1 Type A
  - 1x Arduino mega
  - Many jumper wires
  - 1x Breadboard
  - 1x DC Motor
  - 1x Stepper Motor
  - 1x Hour hand (with Phosphorescent stickers)
  - 1x Minute hand (with Phosphorescent stickers)
  - 1x or 2x potentiometer(s)
- 'Private Time': Motor Clock v1 Type B
  - 1x Arduino mega
  - Many jumper wires
  - 1x Breadboard
  - 1x DC Motor
  - 1x Hour hand (with Phosphorescent stickers)
  - 1x Minute hand(with Phosphorescent stickers)
  - 1x Seconds Hand
  - 1x potentiometer
  - 1x Gear Train (3x gears min, ratio 1:60:~~360~~)
- 'Private Time': LED Clock v1 and v1+ (estimated)
  - 1x Arduino mega
  - Many jumper wires
  - 1x Breadboard
  - 1x Red LED
  - 1x Blue LED
  - 1x Green LED
  - 1x Yellow LED
  - (Possibly) 4x-6x buttons
    - 4x for duration adjustments for each LED
    - 1x for reset?
    - 1x for activating/Deactivating prototype?

OR
- o   1x potentiometer + 2x Buttons
  - ▪   1x for reset
  - ▪   1x for cycling through LED delay controls?
  - ▪   1x for activating/ Deactivating prototype?

Although having failed to escape its existence in mind space, I imagined that the motor + hand based version of the clocks to be **Prototype Iteration 0.**

Expert Interviews

Conversation with experts with either a specific academic focus or personal interest in the nature of time or horology proved invaluable when it comes to sharpening the design of the Two Time prototypes and informing me of the directions in which to discover current literature, histories, and philosophies associated with contemplations about time itself. Interview notes can be found in Appendix A.

Dr Eric Kerr

The conversation with Dr Kerr transpired when we were just beginning to conceptualize our prototype, the point he raised about the discrete nature of time was particularly salient, in that such a view was one publicly agreed upon, hence there are in actuality many ways of experiencing and perceiving time with the historical precedent of daylight, event-based, or seasonal time. His comments confirmed the motion to depict the 'Private Time' clock in a series of differently coloured LED whose on/off state, colour, blink interval and intensity could convey meaning to a user.

Besides which he further questioned how we came to define 'private' and 'public' time, having us sharpen our definitions of each, he also suggests a view of the social aspect of time, in how each(private/public) time affects the other. Relationally, this leads to how time can be 'marked' by the relative import of things/events. This is followed by a discussion of the differences in the measure and perception of time. Afterwards, he introduced various schools of philosophical thought with respect to time, such a Johnathan Tallant's calendar based on *A and B-time*, the *growing block theory, the dimensionality of time,* and so on. He concluded with the concept of spatial things as temporal, but not vice versa as things(to us) exist in time, and without it we cannot

perceive anything without it, leading to how the concept of time differs across individuals and one cannot influence their time but is subject to its interminable march forwards instead[12].

Dr Céline Coderey

Dr Céline, as the professor in charge of the module 'Time and Life' had a lot to say about time. In our conversation, she covered various topics but most centre around the philosophical implication of Time and the perception of it. We contemplated this notion through the lens of history, society and physics. In defining the concepts of public and 'Private Time'.

We explored the definitions of time, in clock time, time zones and how 'Public' time can be seen as clock time and 'Private' time can be seen as 'time for yourself'[13]; so much so that life is colonised by 'Public Time'; it's up to individuals to take control of how much 'Private Time' they want in their lives. Besides objective and subjective measures of time, she highlighted that humans can be said to be obsessed with controlling things; thus, we gave a name to the passage of time, creating boundaries around its shape, in doing so granting us an awareness of time and the capacity (with social concurrence) to control it. However, this is but an illusion, with the devices we use to tell time controlling us instead of the expected inverse (Relates to the nature of technology and immediacy).

This was followed by exploring time as memory, emotion, concept and metaphor (time as a person, or money or etc), in these conversations we noted how the language and metaphors of time are largely spatial in nature, and in its way reflect the interrelation of space-time and associated dimensionalities. We led into considering time can be a form of control, exercised on or by us, relating to established ideas of **structure and agency.**

Directionality of time was also called into question, be it unidirectional (as it appears to us) or in a larger sense cyclical and rhythmic as applied to our daily activities? The Language of time

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[12] I may have misconstrued the discussion but after all, meaning is a matter of perception, right?

[13] Socially, the notions of a 'Public Time' can be seen as a social construct which larger society frames its life around. From the clock the time zones, this agreed construct stems from necessity that is both based on and enables interaction with others in a timely manner. 'Private Time' by its very definition can be seen as a time for yourself and given how its explicitly a private endeavour of meaning-making, you might be influenced by the pace of 'Public Time' but ultimately 'Private Time' is largely subjective, or comparatively more so that 'Public Time'. (Depending on the lens utilised)

was next, besides the apparent spatiality of its metaphors, there is a sense of "rightness" to time in the expressions *on time, in time, ahead of time* and so on. This also introduces a relation view of time.

We covered the notion of Slow Movement and [Kairotic/Chronos Time](#), of which both will be covered below.

We briefly touched on the circadian rhythm and how animals have no sense of 'human time', this had me reconsider the two categories we have classified perceptions of time into, would the notion of an 'Instinctual' and 'Socialized' time fulfil the same bifurcation?

We concluded with a brief discussion on the notion of waiting as a concept but is largely unrelated to our areas of exploration.

Dr John Van Whye

Dr John, a historian in his own right commented on the human and non-human history of time telling. From considering the nature of seasonal(Harvest season), activity, or event-based time(Sunrise, Sunset) to the inventions of the first sundials, water clock, hours glasses and so on.

He also added how the accurate measuring of the passage changed the nature of work in the industrial age, with the worker not pegged to the clock as opposed to the task. With the nature of production goals facing upwards pressure to continually increasing demand and required volume to meet said demand; factory work is no longer rewards for a task-based competition of work but a time-based duration of work, regardless of the number of tasks completed, ultimately it might be a means to improve overall output. This could have led to a shift in the way work and the lives of workers are construed.

With time seemingly enslaving more than it freeing, he explained how experiments with the human 'body' clock differed from the 24 hours we have set for a day, illustrative how we may not have accurately assigned divisions of time consistent with our biological clocks.

He also covered how he personally uses sound from the chiming of mantlepiece clocks to tell time which ties into how the act of reading time privileges sight and like the Eone's [Bradley watch](#) the other sense ought to be engaged when measuring and receiving time, however due to the difficulty in keeping an audio representation of time concealed as per the "Protect Time" directive in our design statement, this view while interesting may bot align with the statement of design intent

A Brief History and Philosophy of Time (as it relates)

Academia

Time (Emery 2020)

Unsure of how useful the larger philosophies of time relates to the Two Time Prototype. I felt a reading into the theories associated with time and the perception if it as useful in scaffolding how I think about the Two Time Prototype.

From McTaggart's A and B time, Reductionism, Fatalism, Presentism, Eternalism and the growing block theory amongst other theories of time. I found the concept of the dimensionality of time and the Dynamic & Static Theory began to address the relationship between space and time which in turn links to the languages of time, which I strongly believe deem further exploration into (see below). I found the difference between the absolute nature of A time and how it relates to B time mirror the divisions I have suggested for 'Private Time' and 'Public Time'. However, most of this reading although interesting is much too dense to be applied to this prototype.

The Experience and Perception of Time (Le Poidevin 2019)

In an effort to narrow literature to related concepts, this source provides a narrow exploration of how time is perceived and experienced. From arguing that temporal perceptions is a product of the mind and one "cannot perceive objects out of time" but has to perceive objects over a time interval to the duration in which is to be defined as the 'specious present' and even questioning how one cannot experience the past as if it was the present(therein lies the notion of the strengths of the *memory trace*).

Fascinating as it was I found it hard to apply concepts of the reading onto the prototype. However, I'm certain that the underlying concepts of temporal perceptions lead me to be more aware of how I myself approach the representations of time (discrete vs continuous vs sequential) in the Two Time Prototype.

Time, Times, and the 'Right Time'; "Chronos" and "Kairos" (Smith 1969)

A break from heavy philosophizing. This reading and concept were inspired by Dr Céline's interview, in which she brought up the concept of *Kairos* and *Chronos.* Having considered how *Kairos* time is widely defined in a qualitative and even subject manner of the 'right' time while *Chronos*

time being the quantitative, measurable, objective aspect of time often manifesting in as a *chronology* of time with events in sequential order as applied to the field of history as per the reading.

Even without prior knowledge of these concepts, given their idealistic slant, it is evident that they form the precursor of the concepts of 'Private' and 'Public' Time. Such as the notion of objectivity vs subjectivity, have control over vs being controlled by, sequential vs singular and so on. In so much as their definitions have altered how I thought one ought to represent the respective times.

> *There is a time to be born and a time to die; there is a time to plant and there is a*
> *time to reap; there is a time to weep and a time to laugh; there is a time to mourn*
> *and a time to dance; there is a time to keep silence and a time to speak.*
> *– John E Smith author (Time, Times, and the 'Right Time'; "Chronos" and*
> *"Kairos")*

There is still some muddiness in their definitions with the concept of *Chronos* time considers a 'chronicle' of time as the event within it relates to each other and on top of the value of 'rightness', the concept of crisis/inflexion point is often associated with *Kairos* time, usually in reference to this concept as applied to history. I do not believe the notion of value/meaning can be ascribed to the invented concepts of 'Private' and 'Public' time in a similar manner, although I am unsure why.

Taken literally, 'Private Time' could be seen as a gateway to *Kairos* time, aiding the individual in discovering their 'right' time. This also relates to the languages and 'rightness' of time as alluded to the certain phrases of *on time, ahead of time, over time* and so on; while the view of the 'rightness' of time can be extended into the cultural shift spearheaded but the *Slow Movement*.

History of the Hour: Clocks and Modern Temporal Orders (Rossum 1998)

This source provides a historical perspective of the development of time-telling devices and the influence it has on work, wages, and lives. This detailed overview provides a backdrop in which the Two Time Prototype operates. Beginning with initial measures of time such as the Sundials[14] of

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[14] Measured time in a day with the length/direction of a shadow cast by the sun, thus limited to daylight hours.

Babylonia which marked time for the public. Which was adopted by Greece who soon developed variations of a water clock[15][16].

The predecessor of the *hour*, the *"hora"*, described periods of varying lengths, namely seasons. However, with the widespread use of more "accurate" timekeeping in Greece, they divided the day, as determined by daylight, into four segments and twelve divisions, setting activities appropriate to each segment/division and creating the ancient *hour*, a convention of Grecian and Roman origin but of Babylonian legacy, which endures in the 60 minutes of an hour and 60 seconds of the minute.

Fast forward to the middles ages of hourglasses, the tolling of church bells and communal time, "Church's" and "Merchant's" time[17]. The birth of Mechanical clocks[18] enabled the "social disciplining" of the masses and a "loss of individual control of time". Influenced by Taylorism these measures serve to track the performance and corresponding incentive afforded to a worker. Quoting Jacques Le Goff's the "fixation of working time helps mechanical clock spread rapidly due to vagueness of old time indicators and limits of the old signal systems." In turn, leading to factory clocks and the standardization of the work hour/day[19] and the establishment of the work hour/day, pricing the values of one's time, and enslaving the masses to the toll of the hour. This accurately mirrors the comments made by Dr John Van Whye in our interview.

Although the history of the hour was covered in greater breadth and depth in this source, such as how activates[20] of an increasingly globalized world necessitate greater accuracy/precision of time and a standardized "world time"[21]; even without a through reading into its history, I felt that as one who lives in a reality shaped by timekeeping of the past, there is a distinct sense of my time being controlled by the ubiquitous clock and the 9,192,631,770 oscillations per seconds of the Caesium atom.

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[15] wine-siphon and outflow models, water clocks were also utilized by India and China.

[16] A water clock measured time by the change in water levels and by virtue of its design allows for division of the hours at night; these devices were used in timing litigation in court proceedings, debates in schools rhetoric and timeliness of council attendees.

[17] As quoted by Jacques Le Goff

[18] Components include a weight drive, gear train, escapements, and indicating mechanism,

[19] Determined by tables of sunrise to sunset times, wage table of appropriate seasons, festal calendars, liturgy data, and length of masses

[20] Postal services, supply chain, navigation required accurate and precise measures of time.

[21] A reference time which time zones are relationally measured against.

Art / Design / Science / Technology precedents

The Culture of Slow Movement (Wikipedia 2005)

Although the Two Time Prototype was developed without prior awareness of the culture of 'Slow Movement', the parallels in purpose and effect highlight the salience of a desire to "slowing down life's pace"(Slow Movement) or "Reclaim Your Time"(Two Time). This movement began with Carlo Petrini's protest against the opening of a McDonald's restaurant in Piazza di Spagna, Rome in 1986 where he opposed fast food, industrial food production, and globalization in favour of promoting local foods and traditional gastronomy and food production. Although divorced from the other "Slow" epithets such as *Slow Art, Slow Living, Slow Parenting, Slow Medicine*, and even *Slow Sex*, the semantics of the word 'Slow' has consistently reflected and unified each movement under a common goal of 'Slowing-down' in their respective fields.

In Praise of Slowness: Challenging the Cult of Speed authored by Carl Honoré with his accompanying TED Talk provides insight into the larger cultural shift sparked by 'Slow Movement'. He argues that how we see time, cyclical vs linear, affects our attitudes within time, in so much that linear time, which reflects both the scarcity of a finite resource and the unidirectionality of 'Time's Arrow', drives us to cram more and more into less and less time. As a result, we grow preoccupied with maximizing time and rushing through life rather than slowing down to live it. 'Human *Doing* not Human *Being*'. He emphasises that this lifestyle has come to hurt more than help, for example being, damaging ones capacity for creativity and more. He then covers how this international movement is working to overturn the taboo of how the motion of slow is synonymous with being lazy, stupid or underachieving – especially when it relates to education, children and parenting.

Although done more so as an exercise in challenging one's perceptions of time, the design of the Two Time Prototype was in part designed with this in mind, for then accuracy and urgency is made ambiguous by the tools used to track them, one inadvertently slow down and as Carl Honoré puts it becomes a "Rehabilitated Speed-o-holic".

MeisterSinger's Single-hand watch (MeisterSinger 2020)

The core inspiration and even blatant plagiarism in the removal template previously utilized MeisterSinger have not only removed the seconds and minutes hand but redesigned the watch face to allow a single-hand watch to tell time (relatively) accurately up in sub five-minute increments. On its webpage, it describes its stated goal of "encouraging a more relaxed approach time as to find the composure and strength within use often lacking on the outside."

Drawing from the historical artefacts of sundials and a "single hand pointing to one moment in time", they believe one in actuality lives for and in the present moment. However, due to the machinations of the human mind, we alienate ourselves from the present moment with thoughts, anxieties and plans of past and future. They believe that with the single-handed watch, one can in increments escape the dictates of time, working with it rather than against it, beginning with a relaxed way of reading time.

Although mostly a bunch of marketing gobbledygook, its role in popularizing the single-handed watch and in its own way, epitomizing a version of 'Slow Movement', aligns with the stated design purpose of the 'Two-Time' prototype. By design, MeisterSinger watches "slow down" one's perception of "speed of time" allowing one to "reclaim their time" to live within the present.

It remains ironic that while I fretted over incorporating the use of a sundial gnomon with a watch head initially, a much simpler and more practical reimagining of a sundial existed(without the need of a floating light source), sometimes, it's best not to attempt a reinvention of the wheel.

The Language(and science) of time by National Geographic (Hughes 2021) and TED Talk (Boroditsky 2018)

Salient in my conversations with experts was the 1984-ian notion of language influencing perception, thought, and action. When applied to time, tensed language and words associated with it shapes the way we view and treat time. Be it the direction it takes[22], its passage[23], its 'rightness'[24], the way it is measured or perceived[25], its value and/or scarcity[26], and more. An example includes how many descriptions of Time in English are spatial in nature, in line with the dimensionality and relations between 3-D Space and 4-D Time.

Lera Boroditsky, an academic with a background in language and cognition specializing in linguistic relativity. In her TED Talk, emphasises that different cultures having very different concepts of time, as a matter of socialization, we inherit a cultural view of time that compliments, and is inextricably linked, to our own. Even the discrete, sequential, and relational concept of

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[22] Left to Right for English-speaker, Top to Bottom for Mandarin-speakers, Right to Left of Hebrew-speakers , etc

[23] Time Flies, Time Marches On, Spend Time

[24] On time, Before time, Ahead of time, Right/Wrong time, Perfect Time, Overtime

[25] Read Time, Tell Time

[26] Keep time, Save Time, Manage Time, Passing Time, Take Time, Times up

numerical representations of time stem from the 'language' of mathematics, philosophy, or observation of the passing of seasons.

With that in mind, Two Time aims to question, while adhering, to certain conventions of representing time; the challenge being toeing a fine line between an ambiguous representation of time and a useless one.
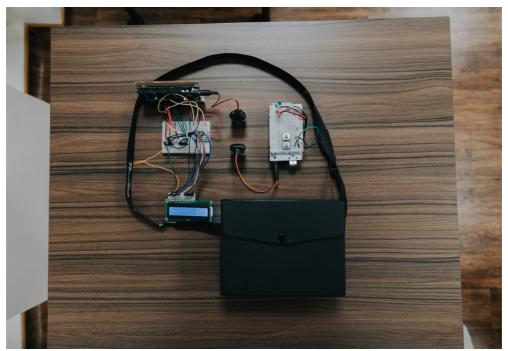
The Two Time Prototype

For brevity please refer to the Presentation Slides alongside the Logbook and above descriptions for various prototype iterations for a detailed account of the function, features, use case, and limitations of the Two Time Prototype.

In summary, the 'Public Time' clock received minimal changes save an addition of a tiny breadboard that allows the LCD screen to be attached to the exterior of the prototype. However for the 'Private Time' clock, the planned designs all fell through, refer to the Week 10 Logbook entry to learn why. The final design of the 'Private Time' clock included a series of four differently coloured LEDs of which turn on for a set period of time sequentially, the user is able to use two buttons to either increase or decrease duration which each LED is on. Such controls are incredibly crude but it's mostly an admission of defeat.
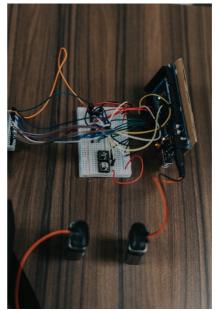
View an online presentation of the Two Time Project here.

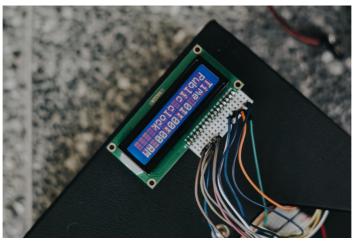*Figure 12 – Sample Kickstarter Photos*

Figure 13 - Prototype Closeups

Cultural Probe (Instructions, Feedback and Remarks)

Instructions – 'Public Time' Clock

Starting and adjusting the Clock:
1. Attach the 9V battery to the 'Public Time' Clock
2. Adjust with the time with the buttons:
    a. Top most button increasing the clock's minutes in increments of +1 values
    b. Bottom most button increasing the clock's hour in increments of +1 values

Notes:
- In the event the LCD powers down, press any button to turn it on again
- DO NOT disconnect the battery once it has been attached otherwise the 'Public Time' Clock will be reset

Instructions – 'Private Time' Clock

Reading the Clock:

The 'Private Time' is displayed as a series of 4 LED Lights. Each LED is representative of daily notable events present in the user's day. Users will thus need to identify what each LED represents.

Starting the 'Private Time' Clock
1. Attach the other 9V battery to the 'Private Time' Clock
2. Adjust the default state with:
    a. Use the top button to increase the time gap between LEDs by half hour
    b. Use the bottom button to decrease the time gap between LEDs by half hour

Adjusting the Clock:

At its default state, each LED is set to stay switched on for 4 hours each, and will switch on one after another. Starting with the red LED, it will remain on for 4 hours, before switching off. This will then trigger the yellow LED to remain on for 4 hours. This process will continue till the blue LED switches off, prompting an 8 hour delay where no LEDs are switched on. This process will then repeat, going back to the red LED.

Tasks over the course of 24 hours:

1. Upon waking, connect the clocks and set the current 'Public Time' as per your smartphone's time
2. Set the 'Private Time' LED as per notable events in a day.

Cultural Probe Feedback:

For 'Private Time' Clock
1. Currently, the LED colours are in a specific order (red, yellow, green, blue), which serve as colour-coded, emotional touchpoints throughout the day, given the rigidity of the flow, it might constrain how people interpret the events of the day
2. Despite being able to change the timing in increments of half an hour, the 'Private Time' clock is still not flexible enough (not able to for example, to a hard switch with a button press) which I would expect for something that's personal and tailored. There is a fine balance between constantly setting/marking the time as compared to watching the time unfold, and it being flexible enough to accurately mark each time period (eg. if i end something 30min earlier than the allotted 'Private Time' LED, what am i supposed to do?)

Reflections

Going into this play test with our existing prototype, we were aware of all the limitations of the current UI for the prototype, especially for our 'Private Time' Clock, mostly this can be attributed to our lack of technical ability and fragility of the prototype.

The feedback also made salient the separation between what a prototype *attempts to represent a*nd if the prototype actually fulfils a function *towards that representation*. With that consideration I believe platform that allows for finer controls are needed (i.e. mobile app) for an individual to first customize their time and second to function as a smartwatch, learning the habits of the user as to alleviate the need for the user input in 'tracking' their ''Private Time', while personalizing 'Private Time' to its user's habits. There is also a need to increase/make less cumbersome access to 'Private Time' while maintaining its invisibility to others.

Given the description associated with smartwatches this sounds much like the 'routines' feature offered by voice assistants and perform certain tasks at set times as to automate one's life, this harkens back to the notion of time as it operates in cycles, and although not intended might be the direction your prototype was, in fact, working towards.

Reflections and Final Thoughts

Concluding this lengthy report, I believe feel rather mixed about the whole endeavour. I enjoyed deeply the philosophical implications of the Two Time prototype however I admit that the sheer depth and breadth of related information required to be processed in order to accurately design a prototype that both *represents* and provides *function towards said representation* of 'questioning perspectives of time' is incredibly daunting. Furthermore being limited by the hardware/prototyping tools in addition to our technical ability in manipulating it, it's evident that I would not be able to come close to how I had envisioned the prototype ought to be.

However, a larger issue lies in the heart of this project. This is the fundamental impossibility of 'Reclaiming your time'. The fact remains that time measuring devices and the agreement to adhere to it creates a contract we cannot divorce ourselves from. Even if we do have a view of 'Private Time', it is unlikely we can truly act on it without serious implications on the daily rhythms of our everyday. Without mass adoption nothing of substance can occur, in so much as challenging the hegemony of 'Public Time' we are enslaved to. The greatest irony is that even our 'Private' or say 'Personal' time is 'scheduled' by events affixed to 'Public Time'.

This calls into question the viability of not only the prototype but also the concepts in itself for even with the knowledge of 'Private Time'. How does one, outside of thought, substantially act on it? If not within the structure of and allowed by 'Public Time' where and what then is 'Private Time'?

Or maybe I'm thinking too much but, I have no allusions of the Two Time prototype being remotely useful other than fulfilling the purpose of 'Art, Ornamentations or Jewellery', which, surprisingly, knowing the world of horology, arguably is more than enough. Oddly, this suggests that the Kickstarter campaign could have emphasised the novelty, as opposed to the utility of the Two Time prototype.

Personally, I was hoping for something more to becomes of this concept but it remains but an interesting exercise that in itself has value but when judged but its efficacy towards its stated purpose becomes one of futility.

Logbook

The following will include a detailed, but messy, Logbook on the development of the Two Time prototype.

Recess Week

Objectives:

1. Materials planning and prototype description
2. Complete Arduino [Intro]
   - Conceptualize Prototype framework
   - Prepare Prototype code
3. Organize Expert Interviews

Our meeting in recess week constituted the outlining of our report framework in addition to the refinement of our statement of design intent. Individual we used the university of YouTube to teach ourselves a thing or two about the Arduino.

At this point I managed to set up a series circuit with a simple code of two sorts of functions, firstly, blinking the LED this required the use of digital inputs and secondly, using a variable resistor to control the rate at which the LED blinks this required the used of analogue inputs.

Experts Interviews

I identified a number of experts I found in my prior residence of Tembusu College and the neighbouring USP. Notably, the experts both are lecturers for modules related to the concept of time. For Tembusu "Time and Life"[27] that looks at time and our perception of it being shaped by anthropological factors, USP "Space, Time and Matter: the shape & size of the cosmos"[28] which

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[27] **Module Description** There are few things that impact our lives as much as our sense of time. Singapore is a 'fast-paced' city where deadlines, time-saving apps and fertility clocks shape people's actions and experiences, and where many feel 'time poor', even if they are cash rich. In this module, we examine the ways in which we take time for granted through analysing the ways in which our lives are temporally grounded. We do so particularly through tracing connections between individual experience, social life and technologies such as clocks and watches, electric lighting and the internet. Is time-stress inevitable in this day and age? What does it mean to use one's time well?

[28] **Module Description:** This module is concerned with the primitive concepts of space, of time and of matter, examined in a historical context as well as what they lead to in the light of modern physics, specifically Einstein's General Theory of Relativity.

albeit less focused on time will inadvertently come to concern it thought applying the lens of physics to a historical view of an evolving cosmos, possibility this might relates to the fourth-dimensionality of time and related dimensions, which although distant for the perception of time in this project, it remains undeniably *cool.*

Having initially approached this idea from a one of philosophy, I felt that we might neede some references to current literature and perspectives (Epistemological or Phenomenological) on it.

Some references: https://plato.stanford.edu/entries/time/

Prototype Description:

The prototype will primarily consist of two clocks, one displaying 'Public Time' and the other 'Private Time', of which both derive their functionality from the (one or two) Arduino mega(s). Both clocks will be enclosed in a rectangular black case made out of hard plastic with a popper flap closure, the enclosure will be attached to a camera sling to be carried around, in a way creating a "Slingwatch". In order to as faithfully as possible, stay true to the portable nature of a wristwatch, while working around the limitations of the Arduino components needed to create a working "clock".

Notably, the 'Private Clock' will be hidden (or protected) within its enclosure, only visible/accessible when the enclosure's popper flap is lifted whereas the 'Public Clock' would be feely displayed for all to see, in the same way wrist watches(used to track 'Public Time') are typically worn on one's persons.

Students will explore the nature of space and time, mass and energy, in relation to a description of physical reality. It discusses the evolution of our understanding of these fundamental concepts from Aristotle to Einstein, and begins with intuitive ideas of space, time and about gravity, demonstrating how these had to be radically revised over the centuries in order to correctly describe nature as best we know it now. Three strands, namely the philosophical, mathematical and physical aspects, are used as the framework for examining the central issues involved. The module gradually leads the student to the modern physical viewpoint of Einsteinian relativity in which space, time and matter are not only intimately related, but in a sense actually unified. We hope to impart a critical appreciation of the concepts discussed as well as the ability to perform simple calculations that quantitatively explore some of the implications of these profound ideas for cosmology - the study of the large scale structure and evolution of the universe. The treatment will in general emphasise the role of fundamental or primitive concepts and ideas in the evolution of our theoretical or mental picture of the physical universe and how these were modified and extended by taking into account new 'facts' provided by observation and experiment.

Prototype Inspiration:

The inspiration for this prototype came from the GMT watch, where in one wristwatch, one can read time from two time zones with an addition of a fourth watch hand to act as a secondary hour hand, as its history is intertwined with those of the pilot watch and the role and needs of pilots, I thought such inspiration as fitting for how we can go about thinking about the duality of different times based on our own subjective view of it and how our time is also influenced by our location within space.

It is also interesting to consider issues such as the relationship a pilot would have with his/her watch, how pilots experience, *feeling* vs *knowing*, time when in flight(reliant on daylight or otherwise?), or even when crossing time zones and so on.

Prototype Iteration 1:

We envisioned that that "clocks" though electrical in nature could as close as possible mimic how time is displayed in analogue three or two-hand watches. Hence, we followed by thinking through how we were to utilize the Arduino mega to create a circuit that allows for the display of both 'Public Time' clock and 'Private Time' clock using two motors, two gear trains tied to two sets of clock "hands" on for the 'Public Time' clock the other for 'Private Time' one.

For the lack of deeper knowledge, I thought we can hard-code a clock into the Arduino, however, I failed to consider how I would keep time when the Arduino is turned off.

Initial thoughts on the prototype:

Functionality: Initially, we thought we each had one motor and thus in order to create a three-hand 'clock' with the motor we needed to create a gear train with a minimum of three gears organized with a teething ratio of, 1:60:360 of each will be attached to a shaft that it's fitted with a "watch hand". This closely resembles the mechanical/analogue functioning of a mechanical wristwatch (the artefact).

Probability: Next, we tried to make the 'clock' more portable and more closely resemble a wristwatch, or at minimum a pocket watch. Due to the size of the components, we landed at a *purse* 'watch' size and house the components in an appropriately sized box with a camera strap attached to resemble a chain of the pocket watch or strap of a wristwatch. This is now a "Slingwatch". We have yet to consider how time should be displayed on the prototype. Also, we thought of using glow in the dark stickers to cover the clock hands to serve the dual purpose of allowing for the time to be

read in the dark and more closely emulate the C3 Superluminova applied on the hands of Stowa's pilot watch.

Variability: Even though the current concept was an unproven one, I've begun to think about using a potentiometer in the circuit of the 'Private Time' clock to both illustrate the malleability of 'Private Time' and allow an individual control over the "speed" of their time by controlling the resistance applied to the circuit and hence the speed which the "clock hands" move. In allowing for such adjustments of the passage of time by an individual, this illustrates the agency an individual has over their 'Private Time'.

At this point most thoughts were hypothetical and we were still unsure of the feasibility of such a prototype but were cautiously optimistic.

Week 7 (Prototyping Session 1)

Tentative first steps and rethinking of assumptions

Objectives:

1. Begin Prototyping
   a. Create a working version of the two-handed motors and gears-based clock.

In Class review:

We had a revision of physics, learnt about circuit diagrams, how to read confusing resistors, how to design parallel/direct circuits illustrating how this affects current flow with switches in both parallel and series. With this accumulated knowledge we found brief joy in the birthing of simple circuits.

Prototype Iteration 2 (Designs of Prototype Iteration 0):

More digital, less analogue: After closer examination of the material within the Arduino mega kit I realized that we may not have to involve gears in the first place. Notably, the **LCD display** can be used to accurately display 'Public Time' and will be positioned to face outwards through a cut-out in the black enclosure of the "Slingwatch". Rather than having to fiddle with gears with specific teething rations, the combination of the **motor** and the **stepper motor** can be used to display a two-hand system of just the minute and hour hand respectively for 'Private Time' this can

be hidden within the box and only revealed when desired to be viewed. The stepper motor is especially useful in how it allows for specific fixed adjustments.

Less Discrete/More Ambiguous? After our first expert interview with Dr Kerr, I was reminded that the very nature of how we interpret time, with discrete Arabic numbers on a dial of some sorts, is all too often taken as a given. Hence, I began to think of new ways to interpret the passing of time, in order to introduce more ambiguity in the system to reflect in how our perceptions of time passing is ultimately a subjective one. I also toyed with the idea of using blinking LEDs of different colours to aid the reading of time in low light situations.

Extensions to alternate but similarly inaccurate ways of viewing time: If we were to remove the variable resistor, we can LEDs light intensity (dim for lower numbers, bright for higher numbers) to give a rough indication of the passage of time? Could we also use blink rate and change in blink rate to communicate different messages in the 'Private Time' clock? It does sounds cool but also difficult to implement and incredibly inaccurate.

Do we need a RTC?: I further consulted a friend on this, and he recommended that I might need a Real Time Clock (RTC) to keep the **LED display** accurate even when the Arduino is powered down. However, supposed the Arduino is powered down how can I use the RTC for the more analogue 'Private Time' clock? It looks like a bunch of complicated code is needed to align these bits; I would rather go without it.

Two Time In a very I-see-what-you-did-there moment I also thought of a fitting name of the porotype which I would refer to from now on as **Two Time.** Reflective of how the prototype has *literally* tracks the passage of two times and by using the prototype one is also *literally* "two-timing" their time.

Expert Interviews:

I managed to attend a seminar hosted by one of the experts of Tembusu college. Fascinating, they talked about how smartphones influence the perception of time and how CVOID has impacted mothers in transcendental parenting and….. wait how does time relate to this?

I've found another professor that was an appropriate expert thought this seminar, Dr Kerr, who I spoke too and whose conversation engendered deeper thought into the ways we view time, inspiring me to alter how I plan to depict the 'Private Time' Clock.
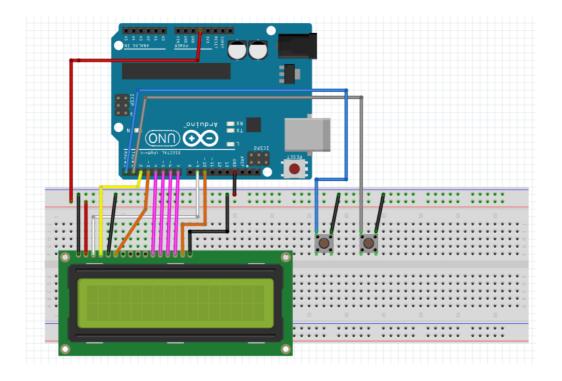
Week 8 (Prototyping Session 2)

A busy week, started with optimism and ended with relief.

Objectives:

1. Build the 'Public Time' LCD clock based on this project link
2. Fit the 'Public Time' LCD clock into the black housing
3. Sharpen design for the 'Private Time' clock
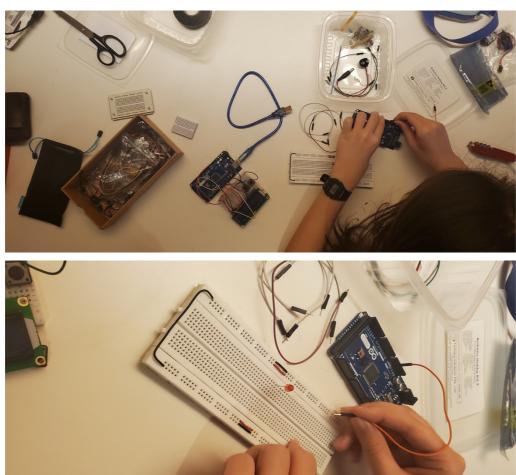
Prototype Iteration 3:

After Dennis (thanks Dennis) helped to solder on the pins to the LCD display in Week 7, I had all I needed to start on the prototype. With the instruction on how to assemble your own precision clock[29] along with its code and circuit diagrams simply described, I decided to attempt to assemble my own version of its circuit. Having roughly understood the code and following the prescribed circuit diagram, I made some slight alterations to the code to suit our designs of a cultural probe.
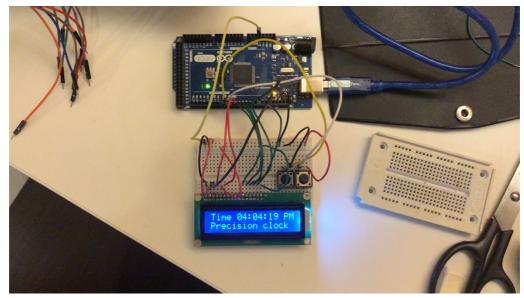

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[29] https://create.arduino.cc/projecthub/plouc68000/simplest-uno-digital-clock-ever-4613aa

We also met to conduct our first joint design exercise, the objective being to fit the 'Public Time' clock into its enclosure.

More wires on a different breadboard After having demoed in class I had a change of heart in cutting up the black enclosure, on the basis, I was unsure on how to make clean incisions on its existing structure. Hence, I opted to have the LCD panel attached to another smaller breadboard with accompanying wires to be stuck onto the surface of the Two Time Prototype.

An easier alternative? Due to the sheer number of wires involved the construction of the 'Public Clock', its fragility made placing it within its black housing a trying task, needing to constantly hunt for and reattach loose wires. This was when the thought hit me that from a purely functional standpoint, not considering the nature of this module and the tools we are *encouraged* to use, would it not be better to *literally* stick a mechanical watchhead (like the one in the artefact analysis) onto the outside of the black prototype housing? After all, it was intended that the individual was to be unable to adjust the 'Public Clock' due to how we are subject and are powerless to control the public conventional means of time telling. From a deeply pragmatic perspective, driven in part by constant frustration, I did consider it, or a variation it where both the 'Public Clock' circuit+audrino would be placed beside a watch head, with the watch head as a backup in case some wire comes loose somewhere in the circuity of the 'Public Clock'.

Ultimately, after the pain my teammate and I went to even fashion the instructions of the 'Public Clock' into a mostly working prototype and along with how I felt swapping out the Arduino (and our shared effort) as an afront to the very spirit of the course. We eventually settled on working solely with the Arduino's 'Public Clock' and finding a way to securely house the in its enclosure.

Expert Interviews:

We spoke to our next expert, Dr Celiene, and was introduced to concepts on Slow movement, Kiarotic time and the Kiraotic Moment(which oddly seems to run adjacent to the concepts of flow and meditation/mindfulness alerting perceptions of time). The interview also encouraged me to consider more deeply the assumptions and the way we converse about time, in terms of the language(limited to English for now) we use to converse about time. "On time, within time, Keep time, Ahead of time", the ways we speak about and hence understand time has always been spatial in nature, at least with reference to a point which is the "right time". This adds a degree of "rightness" to time and if so what is this "rightness" measured by? Further considerations include those of an evolutionary nature such as instinctual time vs learned time, which draws parallels(and perpendiculars) between the biological/animalistic clocks(circadian rhythm) that animals follow and the "learned" time that humans follow. This is explicated in the notion of how we at times organize our sleep and waking hours around a public and agreed upon time rather than the

circadian rhythm. We also considered the notion of event-based or seasonal time and thought if it was possible to organize our time around events rather than seconds minute and hours.

Week 9 (Prototyping Session 3 + Play Test)

Spoiler no playtest, cos we off schedule.

Objectives:

1. Finalize and struggle with the design for the 'Private Time' clock

Prototype Iteration 4:

Surprisingly off schedule, by Week 9 our prototype was not remotely ready for a play test. Instead, we spent time on nailing down how we plan to set up the LED circuit for the 'Private Clock'.

Interpreting 'Private Time'. Ultimately, we decided to have a circuit with 4 differently coloured LEDs, each to be switched on for set periods of time to represent the more ambiguous nature of even-based time. We also wanted to consider created an I/O that allow users to control the individual duration of each LED, for that we came up with a few possible methods(Spoiler they all did not work). Despite the apparent failure in the code the arrangement at least of the 'Private Time' Clock, Courtesy of my teammate is sketched out below.
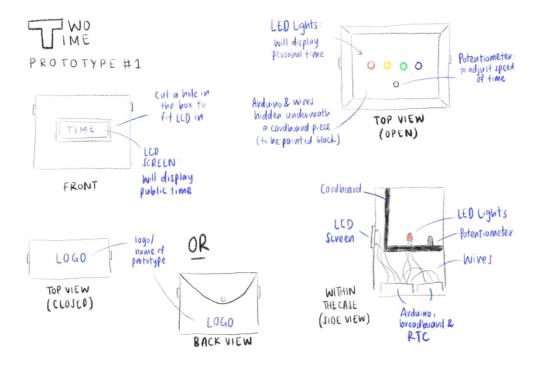

Figure 14 – Sketch of the initial prototype of LCD and LED clocks by Cheryl

Four or more buttons? I initially thought to have buttons control the duration which each LED was on. As we were using delay(x), where x is the int that stores each LED duration, to control the duration the which each respective LED was on.

I also planned to have the code run in a loop every 24 hours and hence ensured that the total duration of the delays add up to 4/4/4/4/8 hours each, whereby default, 4 hours would with the duration in which each respective LED colour is on and 8 hours (sleeping time) where they are off. Using an If/Else statement, I considered that the I/O would consist of a total of 4 buttons that will control each LED's delay() , with each button when pressed will be coded to balance out the total duration of all delays to add up to 24 hours.

Example being when the button tied to the duration/delay() of the red LED is pressed, this will add y hours to the Red LED's delay() would result in the other 3 LED delay durations to be subtracted by the value of y/3 as so as to offset the increase in one duration by balancing out 3 others. Overall, this would ensure that the total time in which the "Private clock circuit" is to be run will add up to 24 hours. I also considered using x/4 where the 4th duration would include the 8-hour delay for sleep. However, I decided against this in order to hold the time used to sleep to be sacred and to reduce the clock's growing complexity.

Giving this concept further though I realized that I have underestimated how many buttons would be needed. Due to the nature of delay() (which now I know I misunderstood terribly), I realized that I might have needed not just 4 but almost 7 buttons. The additional buttons would include.

One to control adjustment made to the 8 hours delay() where no LEDs are on, I will follow the same rules as the other 4 buttons.

The second to reset defaults to all the Led delay() values in case a user cannot remember how many hours have they adjusted each LED delay for due to a lack of immediate user feedback built into our I/O.

The third to control the two phases in which the 'Private Time' clock will run, namely a 'Staging state' and 'Active state'. This is due to the nature of the delay() functions interfering with the running of all code and hence, all adjustments for the LED durations were to be made before the 'Private Time' clock is set to run.
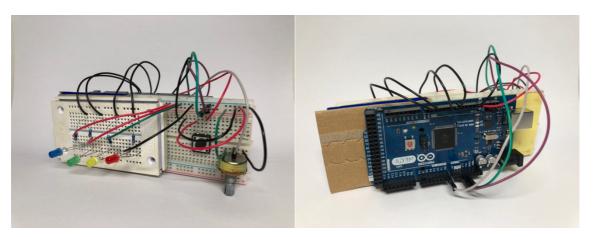
Figure 15 – Wonderful designs let down by code (by Cheryl)

Potentiometer, analogread() and some math. My teammate suggested that we replace the 4-5 buttons used to control the duration of each LED's delay with a potentiometer for a significantly better user experience. With that, I was doubtful at first but after realizing(I was still operating with a flawed understanding of delay() then) that I could use an if/else statement tied to a buttoncounter variable I could cycle between the durations of each LED's delay. Furthermore, I thought of using the analogread() of the potentiometer to tag the max (4 hours) and min (0 hours) delay() duration to adjustments read from to the manipulation of the potentiometer values (0-1024). By calculating the percentage which the potentiometer was its max value, I would adjust the value of the LED delay() according to this formula where:

*Current potentiometer value/1024 * LED delay(4*60*60*1000)=LED delay() duration.*

Then again, I still faced the need of setting up the 'Staging' and 'Active' states. Having seen the limitations of the delay() functions, I saw what I was attempting to be increasingly complex and unfeasible. For one, not a single version of our code worked – at all.

Week 10 (User Feedback + Play Test)

I felt beaten and left out to dry by code.

Objectives:

1. Implement the finalized design for the 'Private Time' clock.
2. Complete the Two Time "Slingwatch" prototype and send it off for a play test.

Prototype Iteration 5 (Final Submitted Prototype):

Although the 'Public Time' clock is finalized, I realized that it was a challenge to both fit the entire circuit, breadboard, and wires were to be fit its enclosure while also making space for the in-progress 'Private Time' clock. In spite of this, we drew up a sketch that laid out the arrangement of the prototype's internals.
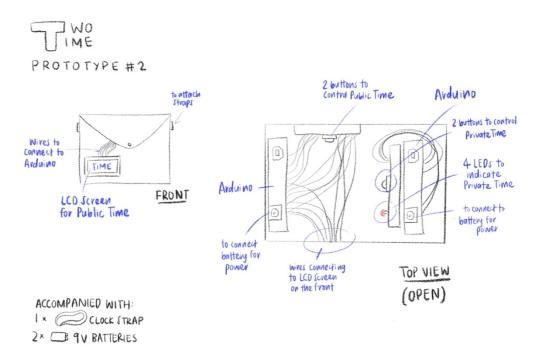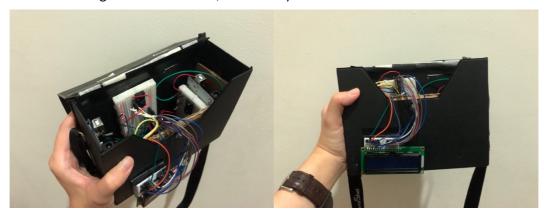

Figure 16 – Final Two Time Prototype Sketch (By Cheryl)
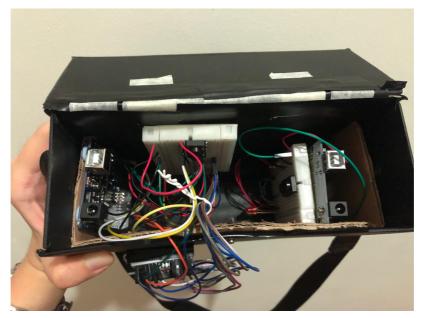
It took a short pep talk that doubled up as a wake-up call to set us on the right path of using millis() as opposed to delay() to managed the durations which LEDs are on. I guess I should have had a better understanding of how to deploy millis()rather than trying to work with the limited nature of the delay() command due to how delay() causes all code to stop running when it is called, hence introducing various errors into our circuit's ability to accept human input while it is running and so on. Even the 'Staging' and 'Active' modes weren't a remedy to this.

Compromise and Defeat. After failing to reconcile our prior designs for the 'Private Time' clock the use of the millis() running clock to handle LED on durations. We opted for a simple two-button system that has one button used to increase the duration of ALL the LED bulbs and the other button to decrease the duration of ALL the LED bulbs. With this concept, one can no longer exercise fine control over the duration of each coloured LED but instead is only able to affect coarse adjustments to the "speed" which their 'Private Time' clock runs. This actually changes our prototype's intended effect and will be reflected in the final report.

I would say even though it works we have fallen pretty far from the goals and ideals we had hoped to achieve with this prototype. It was a shame that we could not get the arguably better-designed potentiometer and two-button setup to work, and I felt that this was truly caused by inexperience with the prototyping tools and IDE. I was surprised but also not surprised that a design which seemed so simple was so difficult to execute.

On my Cheryl's end, she had to execute the plan we had to fit both the components of the "Private and 'Public Time'" clock into the challenging enclosure. Thankfully, she clearly had better space and wire management skills than I, and handily succeeded.

Week 11 (Kickstarter Campaign + Video)

Objectives:

1. Review playtest results, and iterate upon comments
2. Plan, Shoot, and Edit the Kickstarter Video

Prototype Iteration :

Instead of going over the results of the cultural probe, we got carried away with shooting the Kickstarter video and campaign photos, we even made a beat sheet on it(attached in Appendix B). We will be addressing the results of the play test in our next meeting. We also begin on the slides for our Kickstarter presentation, with myself, in charge of the video and Cheryl the slides, at least initially.

The video and photos can be found in the submissions folder.

Week 12 (Prototype Iteration)

Objectives:

1. Plan, Shoot, and Edit the Kickstarter Video

Prototype Iteration 5 (Final Submitted Prototype):

We eventually covered the results of the cultural probe however most comments reflected the flaws we foresaw with this prototype iteration, such as the rigidity of the LED sequence and the lack of granularity/fine/specific controls over each LED. Ultimately, I think these comments arose from the disconnect between our technical skills and creative vision, in so much as we had to compromise considerably to make a functioning 'Private Time' clock.

Extensions to the Cultural Probe

Be moving beyond such comments I wanted to consider the system in which one interacts with the prototype as per its statement of design intent. Even if we somehow design a UI that can do meet fine adjustments to say the LED sequence, ultimately such interfaces require a user to initiate input which may sometimes interfere with their experience of their 'Private Time'(or was this the Prototype's purpose all along, considering it encourages users to 'take control' of their time).

I would hope for a more serendipitous experience where the prototype would actively recognize a user's current activity/state of mind, to discern or perhaps even attribute a value/modifier/multiple to their experience of said activity/state of mind and associate effect on

their perception of time. To posthumously inform (an influence) a user of their 'divergence' from the passage of 'Public Time', rather can interfere with their personal experiences of time.
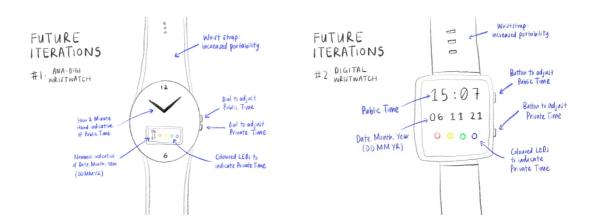
Just musings, I guess.
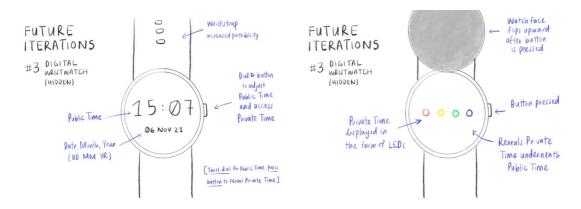
While working on the Kickstarter presentation we began dreaming up [future iterations](#), if not limited by hardware (and skill) and how we could possibly create pledge tiers for the campaign. As mentioned before, I found it ironic that this 'countercultural' endeavour of Two Time where one is urged to reclaim and exercise control over 'Private Time', is gatekept by the capitalistic (could be argued as communal, not sure) intent of monetarily (which in itself is a human fabrication) buying finer control over the 'Private Time' Controls. Perhaps I could have been more imaginative but in terms of a product, this is the only way I can think of trying a monetary value to each successive iteration.

Despite so, I believe I have found a means to create a low cost of entry for a different more active target audience.

Cheryl's iterations

With myself realizing how much work the overdone Kickstarter video is going to take, I did little else. However on that end, Cheryl took the liberty of sketching out some possible future iterations.
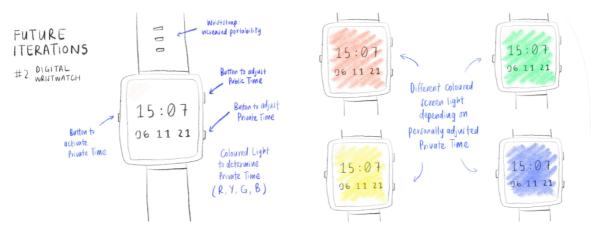
Ideas and Sketches by Cheryl

Week 13 (Prototype Presentation and Submission)

Presentation Day, Murphy's Law showed up in a big way, both clocks broke, spent most of the class repairing them, only fixed 'Public Time' clock, 'Private Time' clock was inexplicably unrecoverable. During the presentation, we faced technical difficulties and came to the realization that video's audio was not mixed properly. This disaster was concluded with being denied destructive cathartic release.

Contributing to the Future Iterations of the Two-Time Prototype

Having not been involved in the design of the future prototype iterations, I found my errors in the naming of the sketches, with future iteration #1 was in fact an 'ana-digi' design of a wristwatch as opposed to a 'mechanical one, think G-shocks. It was then it hit me of the (in my view) way was the best way to represent the Two Time prototype in wristwatch form.

Idea by Sean, sketches by Cheryl

G-shocks have an illuminator button to light up the watch face when necessary This is access via physical buttons that other than activating an illuminator can be used singly or in

conjunction to access various watch functions. Seeing how we are opting to represent 'Private Time' by varying the colour of light, I thought that we could use the above means to, in plain sight, discretely allow a user to read their 'Private Time'. The only surprise here was that I took so long to think about it.

Reflecting on Presentations (Given and Observed)

On the level I felt that we did pretty well, although we chose to separate the tasks into me taking ownership of the video and Cheryl the presentation. I felt that I have added more to optimizing the presentation structure when I saw the some groups have included key components in a Kickstarter campaign absent in our own such as protype timeline, a more detailed development journey, funding breakdown and more. I'd always assumed that was not within the project's scope.

I've also found the addition of a 'Feasibility'/'Use case' section in the presentation alongside a focus on probability interesting as I was personally more worried how the respective times ought to be represented to meet the criteria stated in our statement of design intent. Though, I must concur the pragmatic focus on probability is probably wise with how the artefact the prototype is based on is essentially a 'Portable clock'.

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Appendix A – Notes from Expert Interviews

Dr Eric Kerr

- Questions were raised by Dr Kerr about the concept of Public vs 'Private Time'; what do these terms mean, is this how we should distinguish time, and is that the only way to do so?
- Encouraged us to look up Jonathan Tallant (developed a viral calendar)
    - Compared the differences in a traditional wall calendar (where time is presented in a specific way) vs. google calendars (designed like a spotlight and is presented in a different way)
- 2 prominent schools of thought regarding the philosophy of time
    - Analysis of time (time as phenomena), where there have been different proposals over the years on what time is
        - "We're on a line, time progresses on this line"
        - Everything that exists is on this line, signifying the beginning till the end
        - Alternatively, time as a block, where the past is represented through a block already built, and the future as the block not yet built/made
- Perception of time (external vs. internal)
    - Pointed out that the public sense of time influences our private sense of time
    - Need to consider how we measure vs how we perceive time
        - Measuring: can be done through eg. a clock, and this can be used publicly
        - Perception: something we don't experience as discrete units, but rather perceived as something continuous
- Could we maybe explore outside discrete units of time?
    - Idea of spatial things as temporal, but how we don't perceive temporal things as spatial
    - We can't perceive anything without time, we're objects with consistency with regards to time
- Concepts of time differ among individuals; dependent on societies, environments, climate etc.
- Conceptual shift of the passage of time (ie. emergence of schedules, etc.) is influenced by society
- Time not influenced by humans, but rather humans are influenced by time
- Discrete vs continuous representations of time
- Time's directionally is only forwards (as it appears to us)
    - Human perceptions are fundamentally temporal

- o How we measure vs how we perceive time?
- Only the present exists?
- [Theories about time](#)
  - o Time as a growing block
  - o Space in time or time in space?
- Social aspect of time
  - o 'Private Time' might be influenced by 'Public Time'
  - o Perception of time infulenced by society, history, physics
- Time can be marked by the relative importance of things.
- Anthropology can be useful to think about time in that some languages do have present and future tense
- Speed of time? (subjective and objective and dependent of perception, unmearsuarble.)
- Made me rethink the discrete and curious aspect of time, modified prototype to present 'Private Time' as a 'muddied' discrete value.

Dr Céline Coderey

- There are different definitions of time; our understanding of 'Public Time' is defined by the clock, by time zones (is standardised). This serves as our main point of reference
- Dr Coderey: uses clock time (as 'Public Time'), explains that 'Private Time' is more complex, and is time for yourself
- Objective & Subjective measuring of time
  - o Objective: through the clock
  - o Subjective: time is experienced in a subjective manner, a particular hour might feel long for one, but incredibly short for another
- Time measuring devices as an illusion of controlling time
  - o But these devices end up controlling us instead (ie. phone time)
- Life is colonised by 'Public Time'; it's up to individuals to take control of how much 'Private Time' they want in their lives
  - o Are human beings a slave to the clock? How then should we take time to ourselves?
- De facto time: is fast
  - o How do we reclaim our own tempo?
- Time is an emotion, it's a concept
  - o It doesn't have to go in one direction, it could be reverse
  - o Time as cyclical? Or time as more linear?
- Different metaphors for time
  - o Time as a subject? (ie. time as a person)

- o   Time as an object? (ie. time as money)
- o   ^ All spatial metaphors, which make time tangible & physical
- Circadian clock
  - o   Times are ingrained in our biology
  - o   Animals: understand time differently, but still understand (ie. when to migrate)
  - o   Humans tend to sacrifice our circadian clock (we don't get enough sleep, etc.)
- 'Private Time': related to emotions & memory
  - o   'Public Time' is very fixed vs.
  - o   'Private Time' as the meaning you give to things that are associated with your memories
- The idea of waiting as a concept
  - o   People dislike waiting because they feel like it's a waste of time
  - o   It's only when one waits do they feel like it's the passing of time, and the impermanence of time can be felt
  - o   Could we rethink the concept of waiting? Perhaps as an opportunity to reflect on life?
- Public and 'Private Time'
  - o   Socially, the notions of a 'Public Time' is seen as a social construct which the worlds society frames its life around. From the clock the time zones, this agreed construct stems from necessity that is both based on and enables interaction with others in a timely manner
  - o   'Private Time' by its very definition can be seen as time for yourself, and given how its explicitly a private endeavour of meaning making, you might be influenced by the pace of 'Public Time' but ultimately 'Private Time' is largely subjective, or comparatively more so that 'Public Time'. (Depending on the lens utilised)
- Objective views of time is impossible as all objectively is filtered through the lens of subjectivity (Kant)
- Immersion and flow, when engaged in an activity is one such example of a comparatively subjective experience of time.
- Time can be a form of control, exercised on or by us. This relates to **established/obsessive structure and the ideas of agency** (https://en.wikipedia.org/wiki/Structure_and_agency)
- A poetic thought: Time is an oppressive but intangible weight. In the ways that we, in reality can only observe its passing in the forward direction (3-d being stuck in 4-d space/time)
- Humans can be said to be obsessed with controlling things; thus we gave a name to the passage of time, creating boundaries around its shape but as much as names give them control it's also take the, and this creation now controls us. (Relates to the nature of technology and immediacy)

- o We have an awareness of time the capacity (with social agreement) to control it
- 'Private Time' as a means to defend your own boundaries of time, protect your time from public opposing (Dr Celine agrees)
- [Slow movement](#)
  - o To be productive we need to use time efficiently
  - o But doing do you are neglecting other aespects of self identity. As such one becomes a machine of work with no color, no joy.
  - o **It's okay to say no to things,** and take the time for yourself
- We do things all the time we are no human being but human doing
  - o Life is the cycle of doing....
- To reclaim your own tempo
  - o We need to do things slowly or quickly based on the activity
- [**Kairos**](#) vs [**Chronos**](#) **(Greek Myth)**
  - o Chronos clock time, an uncaring God that marches times arrow forward
  - o Kairos the God of the right time? Da heck is this, related to creativity and opportunity
  - o When we take a break we can open a *pocket of time* where we can use all for ourselves. We can just be **Kairotic moment** - don't feel the passing of time a form of external presence, time becomes a sort of space.
  - o In removing oneself from the present one reconnects with self
    - ▪ In doing so a connection between past, present and future is felt
  - o A moment of mindfulness to protect your time sainty and self.
- Time is an emotion/concept/number(date)/dimension
- Time is not unidirectional but we are limited to only seeing it as move in on direction
- Time is also cyclical?(Buddhist) especially when you apply it to our daily lives forms around habits and cycles.
- The way we speak about time affects the way we view it.
  - o *On time, in time, ahead of time* are spatial metaphors, this attempts to make time tangible. This relates to the connections time has with space.
  - o **This adds a level of rightness to time accuracy,** in how being in/on time as form of appropriateness.
- Mitch Albom
  - o "Man alone measures time. Man alone chimes the hour. And, because of this, man alone suffers a paralyzing fear that no other creature endures. A fear of time running out."
- So how do animals think about time?
  - o Circadian rhythm/cycle.

- - Animals have event-based time. This happens in season, migration/mating/etc etc.
- Another way to think about the divisions of time:
    - ANIMALISTIC/INSTINCTUAL TIME VS HUMAN TIME
- Animals don't have a conception of past present and future
- [**Friedrich Nietzsche**](#)
    - "Consider the cattle, grazing as they pass you by. They do not know what is meant by yesterday or today, they leap about, eat, rest, digest, leap about again, and so from morn till night and from day to day, fettered to the moment and its pleasure or displeasure, and thus neither melancholy nor bored. [...] A human being may well ask an animal: 'Why do you not speak to me of your happiness but only stand and gaze at me?' The animal would like to answer, and say, 'The reason is I always forget what I was going to say' - but then he forgot this answer too, and stayed silent."
- 'Private Time' linked to emotions and memory, the meaning we gives to thing
- Humans are incredibly incapable of living in the present, cos we regret the pass and worry about the future
- What Matt Healy said at the 1975 concert? "Is it me of does time moves too fast - in that he looking back forgot how fast he moved the last time he was a New Orleans (He was high)
- The notion of longest/shortest period of time illustrates that one's perception of time is variable/subjective in how we feel and the context we occupy
- On Waiting
    - Waiting is about being attentive or watchful (people dislike waiting- a *waste* of time)
    - When we waiting we feel the passage of time, in how it doesn't pass the way we want.
    - You too, like time, are passing (away)when waiting
    - Hopefully, we can rethinking waiting in a more positive way.

Ultimately her comments had us rethink the way we represent time. Is time, Discrete and clearly marked or Continuous (but not really) and Event/season based.

Dr John Van Whye

- Personal time
    - Defined in waking hours and the events in the day
    - vis-a-vis Event-based time
    - on a larger scale seasonal time
- Histories of time

- Before clocks existed, people have a different sense of time based on daylight (People based time to sun rise and set)
  - Mech clocks and church towers......
  - Coincide with the invention of artificial light?
- Time and Labour
  - Implications about labour
  - Workers have to work a set time as opposed to task based completion.
  - The clock as the slave driver placing workers in the shackles of Serfdom
- Biological clock s
  - Animals don't have our notion of time
  - Animals have daily rhythm and internal 'clocks' and patterns
- Experiments put people in cave, they have no light no watch's, no sense of time
  - Found that human body clock is not 24 hours but different (25 hours?)
  - Highlights how the clock has power over its creators
- Why is a day made out of 24 hours, and minutes hours seconds into 60?
  - Need to find pre-clock sundials
- Harvest time when it's a full moon people call it a harvest moon (reference to the language of time)
- A small recounting
  - I used to be hour min based time efficient person
  - Dr John used to have time log
  - Records how he expends time
  - And codes it into different categories (necessary and goofing off and homework, class and so on)
  - He would total them up and the EOD
- Language of Time
  - There are cultures in the world that dun use our system of viewing time
  - Some tribes may not have a concept for time or the positions of the future and past and ....
  - People use are you free in the 'vague phrase'(afternoon/evening) as opposed to a set discrete time value in conversation
  - We 'read' time
    - Which privileges sight
- Clocks, time and sound
  - Time can also be audible
  - Mantle clock?
  - Roots in church bells?

- - does sound make us conscious of the passing of time
- On radium
  - Radium was used before as an illuminate.
  - Caused mouth cancer, was banned
- Tribal measures of time
  - Alferd Russel Wallace was exploring SEA
  - Sailors in Southeast Asia
  - Sailors cut coconuts in half shells in a bucket and used the time taken for it so sink to track passage of time
    - Clepsydra water clock
- Look into hour glasses
  - History and design
- Activity based view of time
  - Subjective sense of time is based on the activity
  - We can think in a certain way where we can still have a concept of what we are doing
  - if you use a candle at night for light and you can see it go down OVER TIME, someone might not have an explicit word of time they will be talking about the sequential occurrence of sth
  - Or cooking food over a fire
- Time as a means to track efficiency but then again can use tasked based......

Appendix B – Two Time Kickstarter Campaign Video Beat Sheet

Sc	Visuals	Audio/SFX
1 (TS)	[FADE IN] [MEDIUM CLOSEUP] **FRAME A** Open to running **Two Time** prototype frontal view defocused bg on desk [JUMP CUT TO CLOSEUP] Cut to Punch in on **Two Time** prototype timed to SFX [JUMP CUT TO EXTREME CLOSEUP] Cut to Punch in on prototype LCD screen last 4 digits timed to SFX Last time 11:59:59AM [CUT TO BLACK]	[FADE IN]SFX: Watch ticking V/O: "Man alone measures time. Man alone chimes the hour. And, because of this, man alone suffers a paralyzing fear that no other creature endures. A fear of time running out." [VOL UP]SFX: Watch ticking SFX: SLAM/BANG
2 (TS)	[FADE IN] **FRAME B** Model wearing the **Two Time** prototype (middle of frame) over their shoulder opening a door to seminar rooms [JUMP CUT]	[FADE IN]SFX: Watch ticking (VERY SOFT) V/O: We measure our lives to 'Public Time'. One made out of necessity, an exercise of human mastery over its unyielding passage. V/O: Through illusion, we imagined authority; breaking time into discrete values,

	Model with the **Two Time** prototype on desk (middle of frame) [JUMP CUT] Model with the **Two Time** prototype waiting for bus at bus stop (middle of frame) [JUMP CUT] Model with the **Two Time** prototype(time 11:30pm) on bedside table (middle of frame) model falls asleep in the BG {HOME}	exacting accuracy, labelling it, organizing lives, and societies around it. V/O: As much as we sought to control it– V/O: Now it controls us.
3	[PITCH DARK] Model not visible cross-legged on bed **Two Time** prototype between legs 'Public Time' Displays lights up displays a late ungodly hour {HOME} **Two Time** prototype is opened 'Private Time' light(Blue) spills out. A hand reaches in… {HOME} [CUT TO OVERHEAD SIDEVIEW] Blue LED can be seen. {HOME} [CUT TO SAME ANGLE] Soft Light spills into the room, **Two Time** prototype on bedside table open, **Blue LED** can be seen {HOME} Blue LED switches to Red LED Model wakes up, reaches over and lifts **Two Time** prototype up closing it {HOME}	V/O: It's time to take back our time. SFX: CRT click and buzz V/O: This is a 'Private Time'. Non-discrete and ambiguous. Four colours, four events, four meanings
4	[CUT TO SAME ANGLE] Soft Light spills into the room, **Two Time** prototype on bedside table open, **Blue LED** can be seen {HOME} Blue LED switches to **Red LED** Model wakes up, reaches over and lifts **Two Time** prototype up closing it {HOME}	
5	[CUT TO SIDE VIEW OF MODEL AT DESK]	

	Model reaches into **Two Time** prototype – {HOME} [CUT ON ACTION TO OTS] to fiddle with the buttons. Model then closes the **Two Time** prototype, picks it up and leaves frame {HOME}	V/O: Control the speed of your time by increasing and decreasing the duration of each coloured LED
6 (TS)	[CUT TO CLOSEUP TRACKING] On **Two Time** prototype Model walking towards CLB. [CUT TO VOUYER FLY ON THE WALL] Model in lift alone, peeks into **Two Time** prototype, **RED LED** can be seen [CUT TO] Punch in on **Two Time** prototype Private clock, Model closes and walks out of lift leaving the frame	Be it slow movement Or Kairotic time
7 (TS)	[CUT TO **FRAME B**] Model enters the previous frame of seminar room, reaches for door hesitates – Reaches for **Two Time** prototype, looks around and peaks into it (implies light is still RED) Model turns to leave still looking into **Two Time** prototype as he leaves frame [CUT TO INTERIOR SHOT OF PROTOTYPE TRACKING MODEL MOVEMENT] **Red LED** changes to **Yellow LED** [CUT TO **FRAME B**] Model rushes back to open door leading to seminar room [FADE OUT]	A little two-timing can't be all that bad.
7alt (TS)	[CUT TO **FRAME B**] Model enters the previous frame of seminar room, reaches for door hesitates –	

	Reaches for **Two Time** prototype, looks around and peaks into it (implies light is still RED)	
	Model turns to leave still looking into **Two Time** prototype as he leaves frame	
	[CUT TO INTERIOR SHOT OF PROTOTYPE TRACKING MODEL MOVEMENT] **Red LED** changes to **Yellow LED** Model pauses reaching into prototype He hesitates and beings to walk	
	[CUT TO BACK VIEW] [SLOW DEFOCUSING] Model, back to the camera walks out of focus	A little two-timing can't be all that bad.
	[FADE OUT]	
8	[CUT TO] **FRAME A** **Two Time** prototype off centre bottom left of frame	[FADE IN]SFX: Watch ticking
	[LOGO FADE IN] [LOGO FADE OUT] [CREDITS] [CUT TO BLACK]	[SFX abrupt stop]