pobo

For Every Step of the Way

Executive Summary

This report documents the development of Pobo Pod from the submission of the contract book on the 20th March until the creation of a physical and UI prototype on the 27th June. The report familiarises the first time reader with the concept of Pobo, an autonomous stroller designed to make both the parent and the child's journey more enjoyable. The child is seated inside of Pobo while the parent follows behind. The report summarises the underpinning ideas behind Pobo - the user group and market research – before clarifying the system with a holistic storyboard and a summary page of Pobo's key features.

The development of Pobo was divided into two components; the Autonomous Vehicle (AV) and the User Interface (UI). The report documents the progression of the AV from the contract book's prospective CAD, through to the user testing of a Rapid Cardboard Prototype. The user feedbacks from the Rapid Cardboard Prototype resulted in a final CAD model, seen below, from which the AV was modelled using plywood. The detachable seat, designed to provide optimum comfort for the child, was modelled using polystyrene blue foam, polyurethane cushioned foam and lycra fabric.

The UI was developed from scratch up to three mock-up prototypes during this report. The three parts were designed with the same philosophy of an intuitive interface that gave a sense of control to the user. The UI is manifested in a smartphone app, fitness band and a 'laser display' a visual representation of The AV staying within a safe radius of the parent.

Following further user testing of the final prototype, the design for a fully working pod system would be realised, along with creating anticipation within the stroller industry.

1 Introduction

Trello Design Solutions (TDS) have been working on a project called Pobo, an autonomous stroller designed to make both parent and child's stroll more comfortable. The child is seated inside of Pobo while the parent follows behind. The design incorporates autonomous technology of automotive vehicles into strollers to reduce the need to expend effort in pushing prams.

Pobo has three main components **- Nest, Chassis and User Interface.**

1. The Nest is a personally owned seat in which the child sits during use. The Nest is attachable to the chassis and can be transported manually by the parent similarly to a baby carrier or car seat.
2. The Chassis is the autonomous vehicle, internal storage, and the platform upon which the Nest is attached to. To address parental concerns the Chassis has various safety features including collision avoidance, emergency brakes and a limited top speed.
3. The user interface is used to: hail the autonomous Pobo chassis to the user's location; plan jogging routes; view real-time exercise analytics and manage the user's subscription to Pobo's loan scheme.

Pobo's business plan, outlined in the contract book, is a membership scheme with a monthly subscription. This subscription grants 24-hour access to Pobo's chassis, that is hailed to your location from a nearby docking station using Pobo's smartphone and smartwatch apps. Additionally, subscribers are loaned the Nest component, which would be stored in their homes and personally maintained. The full loan of the Nest increases usage versatility and eliminates hygiene concerns about a shared Nest. TDS deemed the subscription scheme to be a very profitable method of marketing.

2 Autonomous system rationale

Pobo is an ambitious and attainable autonomous vehicle concept. Pushchairs are used by all young parents; however the user's experience of the product is constrained due to the physical excursion of moving the vehicle and the sacrifice of both hands to control it. With Pobo, parents can walk or jog with their child in a relaxed manner enabling an improved visual learning experience for the child.

2.1 Market Research

Having studied the top vendors of jogging pushchairs -Baby Jogger, Chicco and Evenflow- TDS came to some key conclusions:

- The benefits of baby jogger are the slim design, use of lightweight material and ease of push.
- The runner's motion is restricted by the handle, there is an inconvenient weight to push against.
- The reduce pushchair weight, the suspension is compromised; increased vibrations from travel make the journey non-ideal for the child.

3 Target Audience

Pobo's target audience is twofold. Firstly, the product is marketed at the parents of children aged between 6 – 36 months, this user group must be convinced that Pobo is safe and improves the strolling experience sufficiently to justify the cost. Pobo's second user group are the parent's children, our product can only be successful if the child feels safe within the pod and experiences unrivalled comfort.

For Pobo's first launch, TDS targeted the two user groups living in the area around Hyde Park, London. TDS is specifically interested in parents who lead healthy lifestyles and are excited by the autonomy of the vehicle. TDS hopes to expand Pobo's docking station network to parks around the country, target audience would evolve into affluent families living in the UK.

3.1 Stakeholder analysis

TDS conducted a stakeholder analysis identifying both the parents and the members of the public as latent stakeholders. Satisfying the latent stakeholders is critical. TDS must keep the public satisfied so that perception of our product is not negative, for example negative public perception could lead to vandalism of the Pobo pods.

3.2 Users

Pobo is the by-product of unassuming user cantered design. Early in the development process TDS committed to looking for real, critical and latent customer needs. These identified needs manifested into personas, which have acted as a compass for the creative team. Pobo is designed for users like Dylan and Alex.

Dylan is a 44-year-old male. After graduating from LSE, he joined credit Suisse where he has climbed the corporate ladder for 22 years. Dylan is super active. When he is not in the office, he is out training for the next ironman or ultra-marathon. He lives in an upscale South Kensington apartment,10 minutes' walk from Hyde park. Until recently Dylan had few life commitments outside work and training. However, he has just had his first child, James, with his long-term partner.

Alex is a 29-year-old female. She just married her high school boyfriend and had their first child, Anika, this past June. The young family lives in a small apartment in Camden Town, North London. Alex is a practicing Dentist, but has taken one year's maternity leave to raise Anika. Alex takes pride in her fitness, and has always stressed the importance of daily activity and eating a healthy diet. She's not happy about the extra weight she has put on during pregnancy.

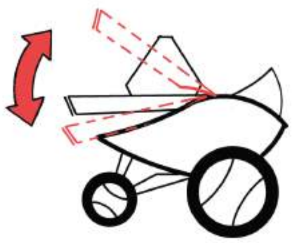
4 System Overview

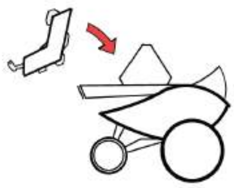
1. Heading Home from Work

As Alex is driven home from Work she orders a Pobo chassis and plots her running route - all using the Pobo phone app.

2. Pobo Enroute

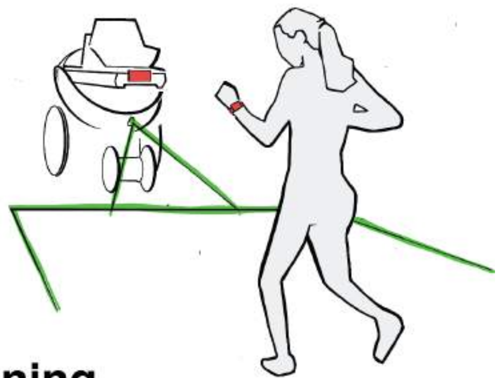
The summoned chassis leaves its charging station in Hyde park and heads to Alex's home





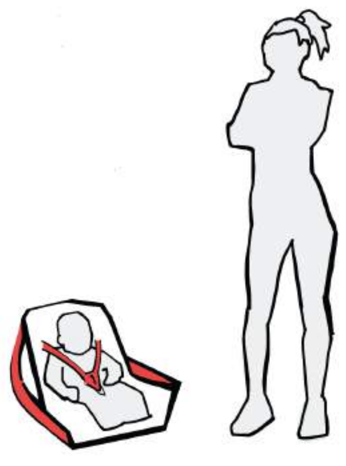
3. Pobo Arrives

Alex arrives at home, changes into her running gear and puts on her Pobo fitness band. Pobo sends her a notification upon arrival and lowers the platform to her desired height. This allows Alex to effortlessly place her nest on top of Pobo. Ping! Haptic feedback sensors in the watch let Alex know that the nest has been secured.



4. Running

Alex secures her phone into the the phone holder on Pobo's handle. Communication between phone and fitness band ensure Pobo never leaves Alex's "comfort zone", a maximum distance she set. The watch, again through communication with the phone, provides pace, time, direction and distance data to power the live analytics GUI. This display is then projected by laser onto the ground in front of Alex.



5. Finished

Alex arrives home and detaches the nest. She speaks into her fitness band, "Ok Pobo, share run to Facebook". The Pobo app uploads her run to Facebook while the chassis heads back to Hyde park.

5 Final Design

This section explains the final CAD design used to create the final prototype of the Pobo pod. This design was reached due to feedback received from a rapid, cardboard prototype and further iterative testing. The feedback from our target user, parents with young children, helped to ensure our prototype satisfied their needs.

Pobo is made of two main components: The Nest and The Chassis

5.1 The Nest

The Nest is modelled upon a car seat with features to ensure safety and secure connections to the chassis.

Key features include:

- The three-point seatbelt
- Adjustable headrest
- A handle
- Hooking mechanism
- Ergonomically chosen angle of seat
- Has multidirectional positioning for many resting positions

Figure 1. The Nest.

5.2 The Chassis

The Chassis is the autonomous driving function of the pod. Additionally, the chassis secures the nest provides storage for the user's possessions. The designs for these are demonstrated in figure. The chassis is designed to be used by any range of adults and should fit to the 90th percentile to accommodate for all parents.

The key features of the chassis include:

- Four wheels with suspension
- built-in revolving wind shield
- Easy access storage for essentials
- Larger storage under handle if necessary
- Functioning headlights and brake lights
- Elevatable platform for nest
- Two directions the nest can be placed on

Figure 2. The Chassis.

5.3 User interface

TDS values the users primarily and aims to provide the perfect set of user interactions for the user. This includes creating a user interface that is “simple to understand and use” and an interface that “gives the parent the sense that the chassis is under control”. These two critical needs were outlined during the contract book as key considerations, especially when creating the user interface and therefore throughout the development of the UI the focus of TDS has been those two statements.

The finalised UI design that TDS created was made up of three components each becoming more accessible for the user. The first is a phone app capable of displaying all the key data and running all the required functions of the user interface. Next is the Fitness Band, which is designed to display data and include safety features in case of an emergency. Finally, Pobo’s laser leash is designed to display data in its simplest format while also alerting you to issues so necessary precautions can be taken.

5.3.1 Phone App

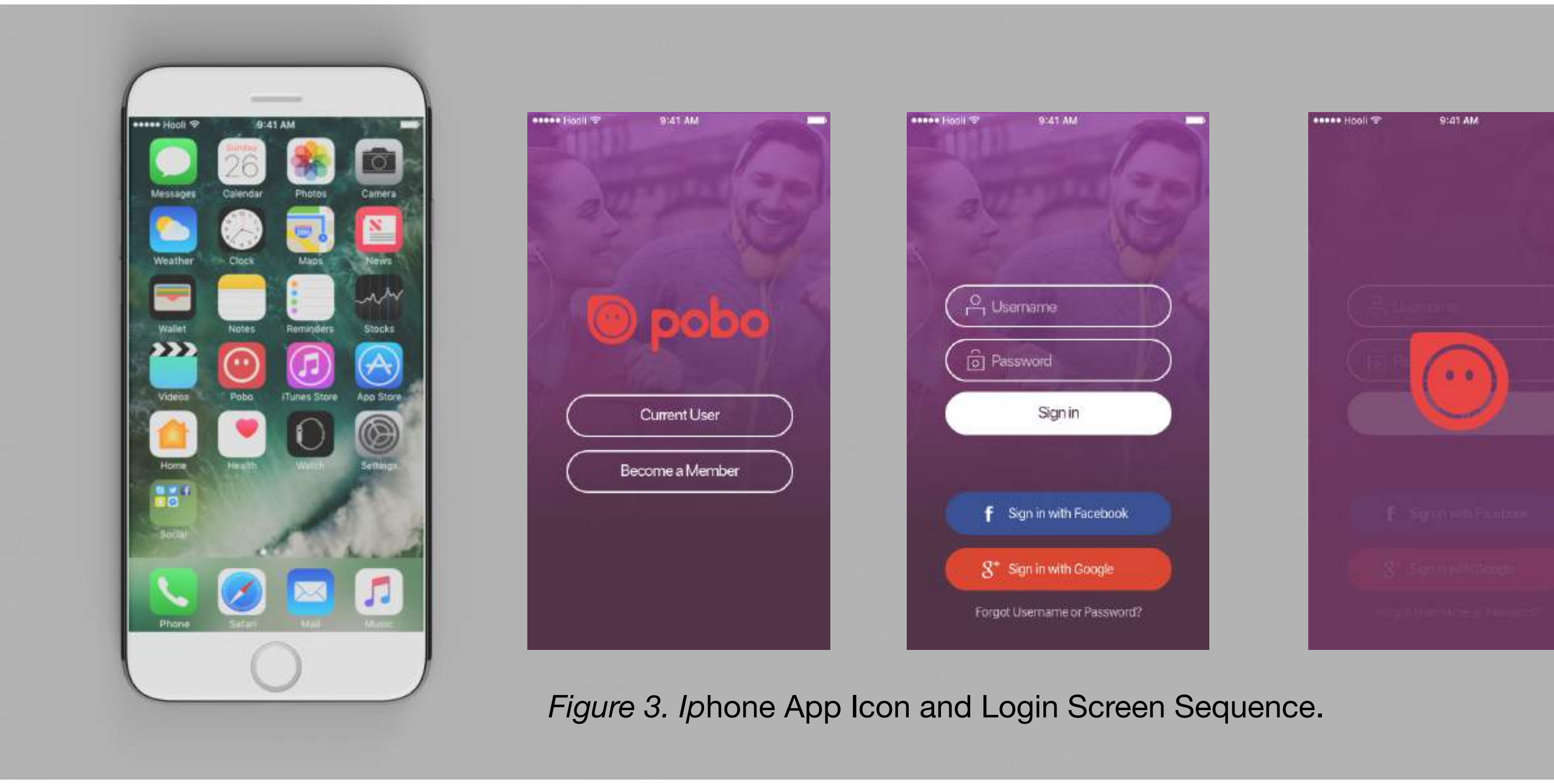


*Figure 3. I*phone App Icon and Login Screen Sequence.

When designing the Pobo app, TDS were focused on on creating an interface that was simplistic and logical to use. Therefore, TDS stuck to simple design and simple methods of use. Starting your Pobo journey can take only three basic touches with the use of the large logos that are easy to see as shown in figure… This use of the big symbols also reinforces the concept of simple and easy to use. The app has also been designed so the three-main data displaying screens that are shown in Figure 4, can easily be accessed with one swipe or one tap from each screen, which can then be shared via social media in a logical manner. The app is simplified even further by planning an accurate route for the user from a rough finger sketch of the route using the existing database of routes in Hyde Park or by simply allowing Pobo to plot the route for you.

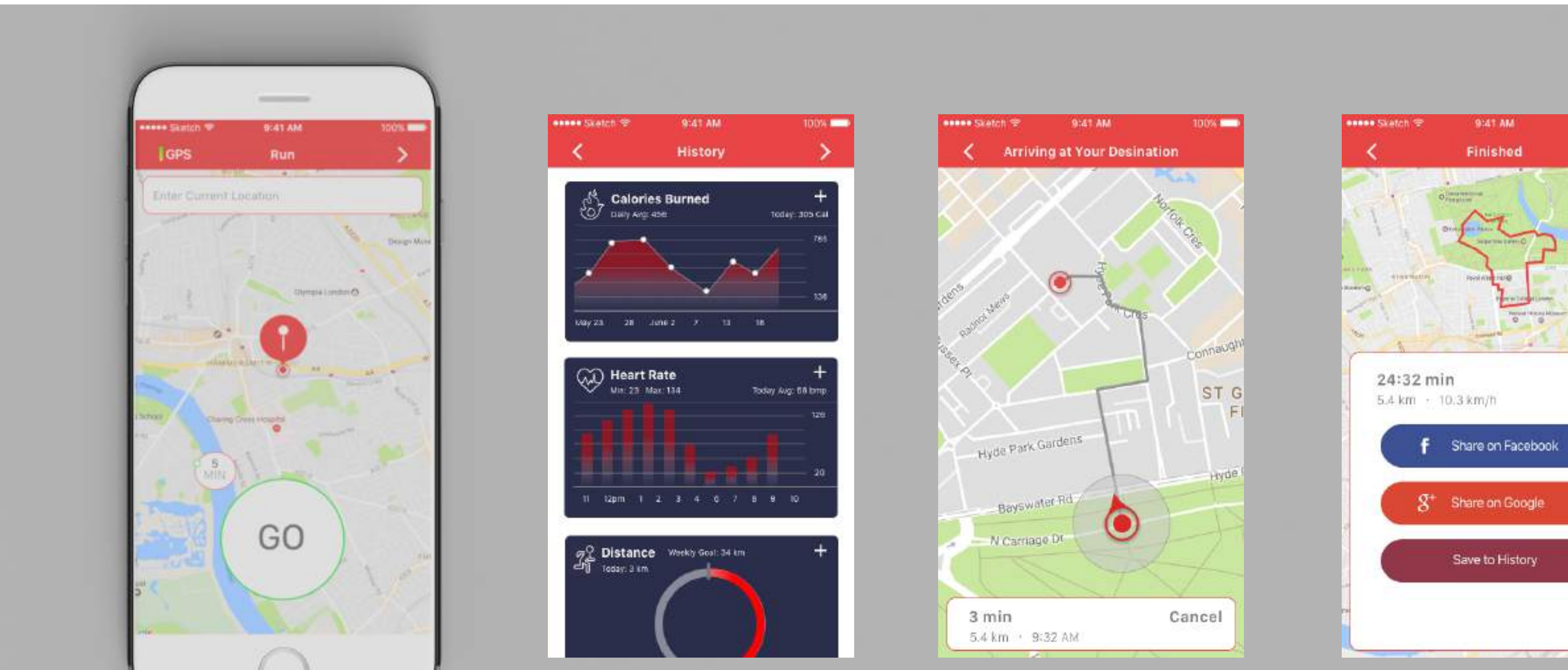


Figure 4. Summon, History and Travel UI Wireframes.

5.3.2 **Fitness Band**

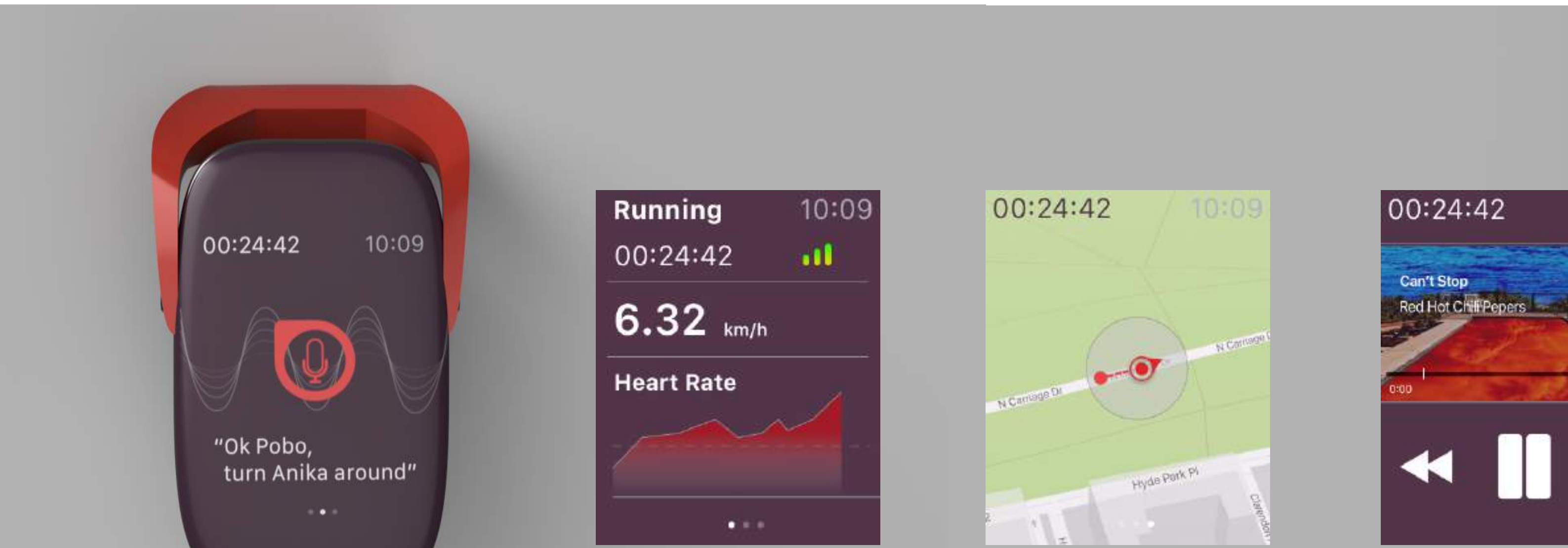


Figure 5. Various UI for Fitness Band. Note the grey circle which represent the "comfort zone" (refer to section 4).

The Pobo fitness band is a user interface that is designed with two main functions that fulfil the “Pobo is under control” customer need. The first is the emergency break feature. This was incorporated after discussion on how the team should go about creating a failsafe mechanism for if the autonomous feature fails. This solves the issue by forcing Pobo to turn off when the red lever shown in figure … is pulled down as shown in figure.. This lever mechanism was chosen to give the user the feel that mechanical brake is being pulled which was chosen to give that sense of control and because the lever action is natural mapping mechanism.

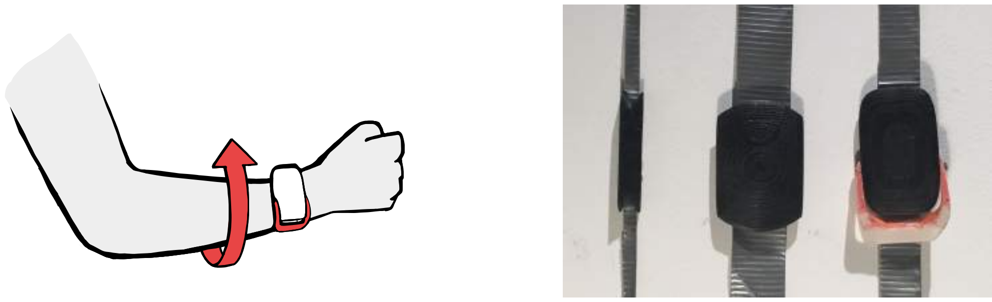


Figure 6. Emergency Break Feature and 3D Printed Prototypes used for User Testing.

The fitness band is also designed to be easy to use especially while running as it can be controlled using voice recognition software. This means the user can carrying on with his usual running motion while still controlling Pobo. The band also simplifies the data that it is showing so it fits to the screen better and is made easier to read making it fulfil the required need. Finally, the band can be connected to a phone to access base functions of the phone for a more personalised experience.

5.3.3 Laser Display

The laser display was an idea that TDS developed after seeing the Nike 2-hour marathon in which a laser was used to set the pace. Using this concept TDS wanted to create a similar concept to display information and set a required pace for the parents. The laser display will function by simplifying the data that needs showing to its simplest forms as shown in Figure 7. This method of creating a display is advantageous as it provides instantaneous information for the parent about which directions to travel and the speed of travel and other relevant significant pieces of data

The laser display also has a “leash mode”. This can be set as a max distance by the parent and if the parent is outside this distance the laser turns red as shown in the Figure 8.

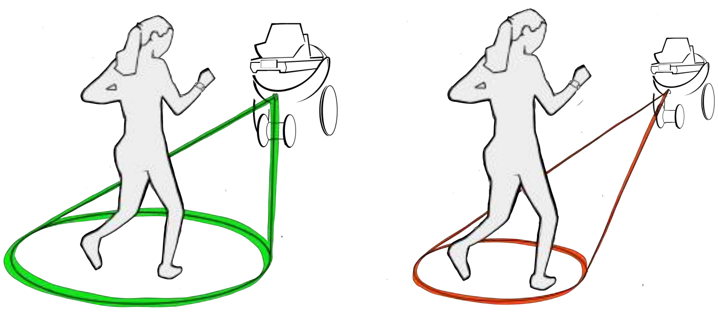


Figure 7. Laser Display Leash Mode.

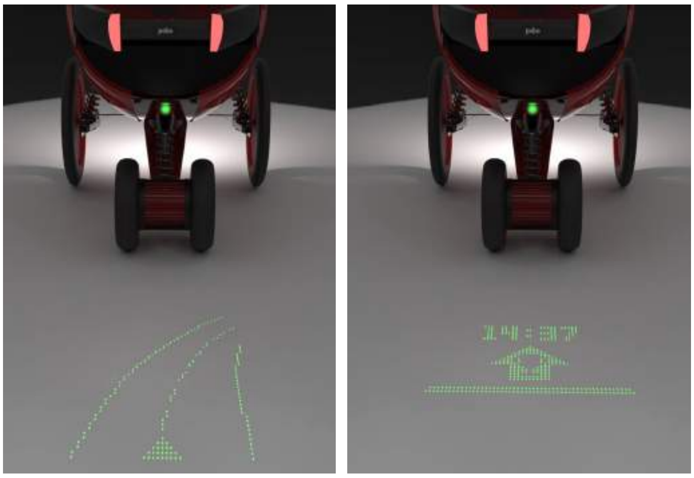


Figure 8. Sample Laser GUI with Live Analytics.

6 Development Approach and Testing Methods

TDS systematically developed Pobo by following an established plan for testing from which the results would be used to iterate and create relevant ideas. This method was used throughout; from the initial development of customer needs until the testing of the final prototype. These tests were conducted in such a way to establish how well these customer needs were being met.

The key testing milestones were:

- User testing of the Rapid Prototype model
- Internal testing in response to the results of rapid prototyping – TDS tested whether our iterations were successful.
- Testing of the final wooden prototype.

6.1 Testing methods

A matrix was created outlining the 80 customer needs identified in the contract book. The needs were assessed on the feasibility of the test (could the test easily be carried out?) and the date the test should take place.

The Following table is an extract from the testing methods matrix. There is a testing method assigned to each critical need, TDS ensured all critical needs are met by the final prototype. The matrix used a traffic-light code to signal the ease at which test could be conducted.

	Period of Testing			
Critical Needs to be tested	With Completed Rapid Prototyping Model	Before Final Prototype	With Completed Final Prototype	Testing methods
1) Needs for Parent				
Parents have complete control	Can be Tested			• Test parent comfort as distance away from pram increases • Evaluate use of tether vs. wirelessly controlled emergency stop
The nest has sufficient storage				• Understand the extra products taking by parents when jogging with child
UI is simple to understand and use	Can't be Tested	Potential for Testing		• Use basic procedure for testing apps to understand whether parents find it complex or simple
2) Needs for the Child				
Child feels safe				• Use a set of questions for the young child to address whether they feel safe, this can also be assessed by parents
Nest is comfortable				• Use a set of questions for the young child to address whether they feel comfortable, this can also be assessed by parents
Child can see clearly out of nest				• Use mathematical concepts, modelling and anthropometric data to visualise the child's line of sight • Use a set of questions for the young child to address whether their vision is restricted, this can also be assessed by parents
3) Using B.S. Regulations to Test				
Nest has sufficient safety features				• Test Pobo's safety features against British Standards
Chassis is durable enough for everyday use				• Model stresses on pram using practical modelling

6.2 Rapid Prototyping Day

This one day exercise proved to be very useful for realising TDS' concept for Pobo. Using cardboard and blue foam the team mocked up the pod in line with the existing CAD from the design proposal. This allowed identification of some key issues with the design idea, additionally the prototype could be user tested to gauge an idea of required changes.

The rapid prototype began to explore the user interactions, TDS discussed various methods of giving the user a sense of control over the pram – a critical user need identified in the contract book. The two main ideas to ease parents' safety concerns were:

- A Bluetooth bracelet that could bring the chassis to a holt by either disconnecting or a physical on/off switch.
- A physical tether connecting the user to the vehicle – dubbed the 'umbilical cord' that could be pulled out to force Pobo to stop.

A prototype of both scenarios was created and tested on the user.

Figure 9. User Testing with Cardboard Mock Up.

6.2.1 Team Review of the Rapid Prototype

- The attempt to model the seating area in accordance with the design was poor and the sole use of the Body Space anthropometry book was unsuccessful. Therefore, it was decided to research dimensions used in current pram seats and baby car seats.
- The use of the rail mechanism (blue foam under triangular shaped storage) to attach and reverse the orientation of nest and storage was successful but it was decided during the rapid prototyping to develop the rail into a 'T' shape for a more secure connection. This change is ideal for stopping thefts of the storage component while it is not being used, addressing issues of the public as latent stakeholder.
- The chassis seemed too high off the ground, this could be corrected via user testing.
- In accordance with making the model unobtrusive to pedestrians the design would need slimming down to reduce space taken on pavements and thus the effect on our latent stakeholders.
- It was also noted that the team members thought the tether could be conceived as awkward but non-restrictive when running.

6.2.2 User testing with Rapid Prototype

The rapid prototype was tested with our user group in Hyde Park. Using the existing testing matrix TDS observed whether the critical needs of the user were being met by the prototype. Additionally, through conversation with the user and observing their interacting with the product – TDS gained more knowledge of the user group.

Conversation with the user group discussed the appropriateness of concept, their opinions on the aesthetics of the vehicle and the desired height off the ground for the handle. These could now be tested using the rapid prototyping model and allow for further iterations based on responses. These interactions were evaluated using questionnaires that were answered by members of the public in the target demographic (Fig. 10)

As shown in figure … this user test judged the distance at which parents felt most comfortable away from the pushchair. The black tape on the path represent metres from the Pobo prototype. Users filled out their results in the questionnaire survey.

(a)

Questionnaire for Pre-Final Prototype

Rating of Rapid Prototype

1 2 3 4 5

Which design is preferred of the three?

Design 1 Design 2 Design 3

Which range of distances would you feel is the most comfortable distance to be away from your pram? (measurements in metres)

0–0.5 0.5–1 1–2 2–3 3–4

Which emergency shutdown method was preferred

Bracelet Tether Both

What essentials do you usually bring with you for the child?

What they use the pram for?

(b)

(c)

Figure 10. User Testing In Hyde Park.

6.2.3 Conclusions from Rapid Prototype Testing

The most important conclusion reached from this user testing was the decision to use a bracelet, rather than a physical tether. This was decided because those who would want a product with autonomous feature like this all seemed to prefer a Bluetooth bracelet whereas those who would use a tether stated they were less likely to use the product. The advantage of this decision is that the bracelet could be designed to be a useful user interface with multiple functions that affect how Pobo works.

The next conclusion that was reached was that there was no common comfortable distance away from the pram (refer test depicted in Figure 10 (a)), the most common answer to that question being whatever distance allows for easy reaching of the pod. Therefore, TDS decided that the speed Pobo travels at should be fully controlled by the user and should never be further than 2.5 m away from the user.

The final key conclusion reached was related to the storage space. The main feedback received from runners and mothers was that the storage was much larger than necessary for the baby and jogging essentials. Many parents could fit the child's essentials inside a bag of volume 1500 cm^3 , therefore the volume of the external storage would be reduced in Pobo.

7 Post Rapid Prototyping Development

7.1 Chassis Development

7.1.1 Storage

The first issue that TDS addressed from the rapid prototyping day was the changes to storage. Initially TDS had concerns over whether the storage box on the chassis would be sufficient to hold the required essentials that a guardian may need. These concerns were dismissed during the rapid prototyping day where respondents stated that the storage space was easily enough for jogging and baby essentials. Despite this, TDS decided to increase the storage space to allow potential of expanding the market from joggers to general use including shopping. Expanding to a market like this would require a much larger storage than the one designed on the initial proposal.

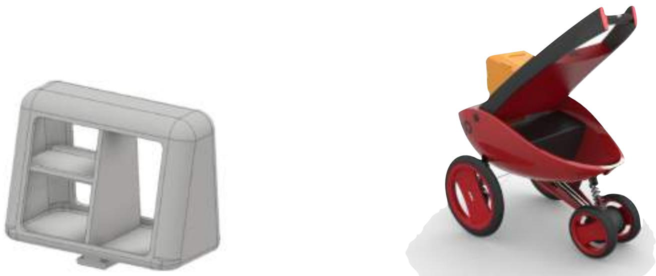


Figure 11. Storage Spaces.

Due to this a much larger storage was needed. This was made available by accessing the inside of the chassis as shown in Figure 11 and this would massively increase the available storage creating the possibility to store large amounts of shopping. It would also need to be well insulated due to its proximity to the engine.

Figure 12. Chassis Headlight. *Figure 13. Upward Position Adjuster*

7.1.2 Road Safety

TDS also noticed that there was potential for Pobo to be used near roads or even possibly on roads while just in Chassis form and therefore should be made to be road legal. Due to this it was considered essential to add brake lights. These were added to the handle as shown in Figure 12. A headlight was also added for use in night time as it is a legal requirement

7.1.3 Height of Chassis

TDS aimed for the Chassis to be comfortable for a range of different sized adults to use. Using the 90th percentile user group presented issues due to the diversity of comfortable heights. To combat this, TDS designed a height adjuster to make it easier to fit the nest onto chassis for taller adults as well as smaller adults. The user position is shown in Figure 13.

7.2 Nest Development

The key issue with nest development comes from the errors in anthropometric data and the difficulty in transferring the researched data into the CAD and then replicating these curves in a model. Therefore, TDS decided that it would be simpler to research the anthropometric using existing car seats and replicate the dimensions directly into the prototype. Fig. 14, to better inform the soft material design of the nest, TDS visited the Mama and Papa store at Westfield Shopping Centre, London. TDS took measurements from the existing seats, Fig. 13. This would allow easier experimentation of the different shapes and would make reaching a final decision simpler.

The other issue was when it came to meeting customer needs. In the contract book design proposal, the nest started with two orientations available for use, which would allow the child to sit upright in Pobo in either a forward-facing direction or a backward facing direction. However, in the customer needs it was also stated that the nest should allow for comfortable sleeping. The issue with the design before was that there should be a comfortable sleeping position which wasn't available and therefore the nest is designed to fit upside down for the possibility of sleeping like shown in Figure 15.

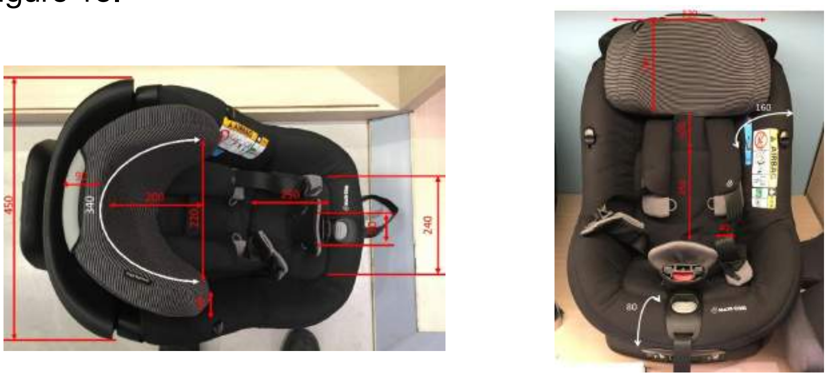


Figure 13. Dimension Car Seat.

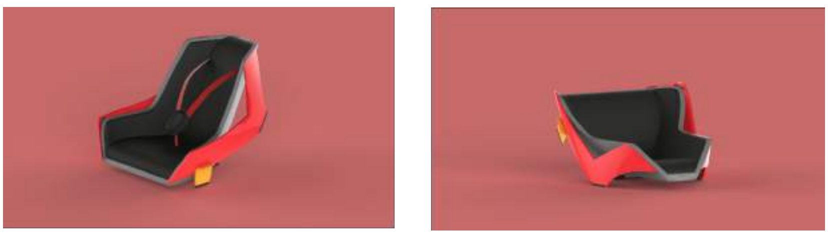


Figure 14. Vertical and Horizontal Positions of Nest.

8 Final Prototype Development

Following all the developments and changes resulting from user feedback, the final vehicle prototype build began on the 20th May. This build development documents the construction of The Nest and The Chassis. This prototype was constructed from plywood, blue polystyrene foam and polyurethane foam cushions.

8.1 CAD

Rhino CAD software was used to produce the final design. Figure x.4 evidences Pobo meeting the user need for forward and backward facing nest, as well as human proportions in relation to the product.

The vehicle interior design changes from the contract book submission were: a pivoted platform upon which nest and storage fasten, ensured to be horizontal when the child is in the nest, but giving access to undercarriage storage; a rotating windshield, connected to the pivot; slimmer looking design.

The important features of Pobo for future reference:

1. Nest seat, with seatbelt and rail attachment to platform (7)
2. External storage
3. Undercarriage 'skin' exterior
4. Handle, attached to platform (7)
5. Platform, with rail on surface to attach nest (1), external storage (2)

8.2 Nest Build

Interpreted Needs to meet	
Nest makes child feel safe	Nest is high quality and ridiculously comfortable
Nest has seatbelt or other safety feature	Nest does not inhibit child's vision

From the Rapid Prototyping day, TDS discovered that modelling the interior surfaces of the nest would be best done by iteration, rather than a predetermined CAD. TDS instructed CAD designer Daniel Yin to develop the exterior of the seat; the cushioned seating would be developed in the workshop later.

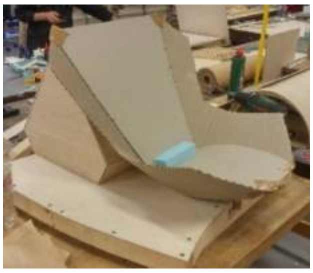


Figure 15.

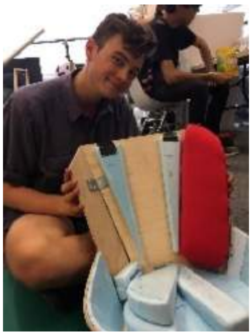


Figure 16.


Figure 17.


Figure 18.

Fig. 15, shows the initial cardboard model of the nest, reflecting the CAD design. This model was a successful test, from which the net shape of the plywood seat exterior was designed and cut.

Fig. 16 and Fig. 17, show the development of the blue foam shapes that were cut and then sanded. These shapes formed a sturdy backing around which the cushioning and lycra fabric could be upholstered.

Fig. 18, using the measured dimension of the buttocks to the shoulder, a headset that could be adjusted vertically (see blue arrow) within this range was created. The headrest is raised and lowered using wooden rails attached to the back of the nest and also to the headrest.

Additionally: white handles were added so that the nest could be carried easily by the parent; and a car seat belt (bought in component) was attached, to meet safety standards.

8.3 External Storage

Interpreted Needs to meet	
Chassis has storage	The chassis is high quality

External Storage Build Documentation

The external storage was built in line with the CAD using plywood sheets, held together by butt joints. The role of the external storage is to hold important and regularly used items, such as water bottles. To allow rapid access, a swinging handle has been included. The storage connects to the platform (refer to 8.5) via rails in 'T' shape.

Figure 19. External Storage.

Figure 20. Undercarriage.

8.4 Undercarriage

Interpreted Needs to meet	
Chassis has storage	The chassis is durable enough for everyday use

Clearly there was a difference between the curves of the CAD and what could be achieved using wood and mechanical fasteners in the workshop. In Fig. 1, TDS created nine aligned 'ribs', the outer circumference of the ribs matched the shape of the CAD. Wooden reinforcements between each rib were added to increase strength of the exterior. Then strips of Jelutong, a highly flexible wood, were added to clad the exterior and replicate the curves of the chassis.

8.5 Handle and Platform

14

Interpreted Needs to meet	
The chassis gives the sense its completely under the parents control	The chassis is durable enough for everyday use
The chassis is high quality	

The platform and handle were built simultaneously, using the dimensions and form of the CAD. The platform was built with 12 mm plywood sheets, giving it the strength to support the nest and external storage. The handle was modelled from flexible plywood, replicating the curves from the CAD – to create these curves, the sturdiness of the handle is reduced as a consequence. As seen on Fig. 20 the handle and platform rest atop of the external skin structure, and would be rotated at a pivot point close to the blue cross. The handle was modelled using a cardboard tube, which the user lifts to access the internal storage.

Figure 20. Handle and Platform.

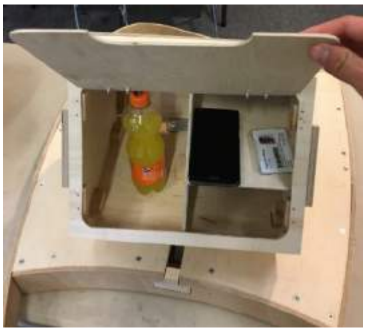
Figure 21. Fully Assembled Mock Up.

9 User Testing of Final Prototype

The aims of the prototyping were to create an assessable product in accordance with a set of user tests. The requirements for these tests were to have a nest and handle which could be tested. In accordance with these testing requirments, the followings tests were ran:

- Is the storage sufficient?
- Is the handle and platform level an appropriate height for the 90th percentile group?

The users were also asked to provide opinions on some of the key mechanisms involved. These are all outlined in the figures



Users tested whether there was sufficient space in the external storage to store their common items. All agreed there was.

User testing the affordance of the sliding mechanism and found it to be very straightforward and easy to use.

95th percentile male testing the lifting function of the handle to see appropriateness of the height and found it to be a comfortable height that can easily be lifted.

5th percentile female testing the approximate heights to which the nest should be lifted to and believed the height to be suitable.

User testing the latching mechanism. Found the method used in prototype not entirely intuitive due to difficulty in seeing the latching mechanism while using it.

10 Next steps

Overall the development was very successful; much of the feedback received during the user testing was positive and the users claimed it to be comfortable to use and intuitive. It was also believed to be an aesthetic and desirable product that met the desires of the users. On top of this almost all the changes made during the development stage were received positively. The only change that wasn't as successful was the attaching mechanism but this could have been caused by not modelling the mechanism correctly. However, TDS will still reconsider this part and consider any possible design changes for this component, a conclusion will be made after further user testing is conducted.

Some areas that require further development include the wheels systems and further understanding of the joints and forces that will be experienced by different stress points on the design. This can be assessed using stress modelling and will depending on the results require further improvements.

Following this the next steps will be to consider manufacturing process and methods of moving the idea along the to the next stage. This will involve creating a fully working prototype and gathering further interest into the idea to gain funding to start the project

Appendix

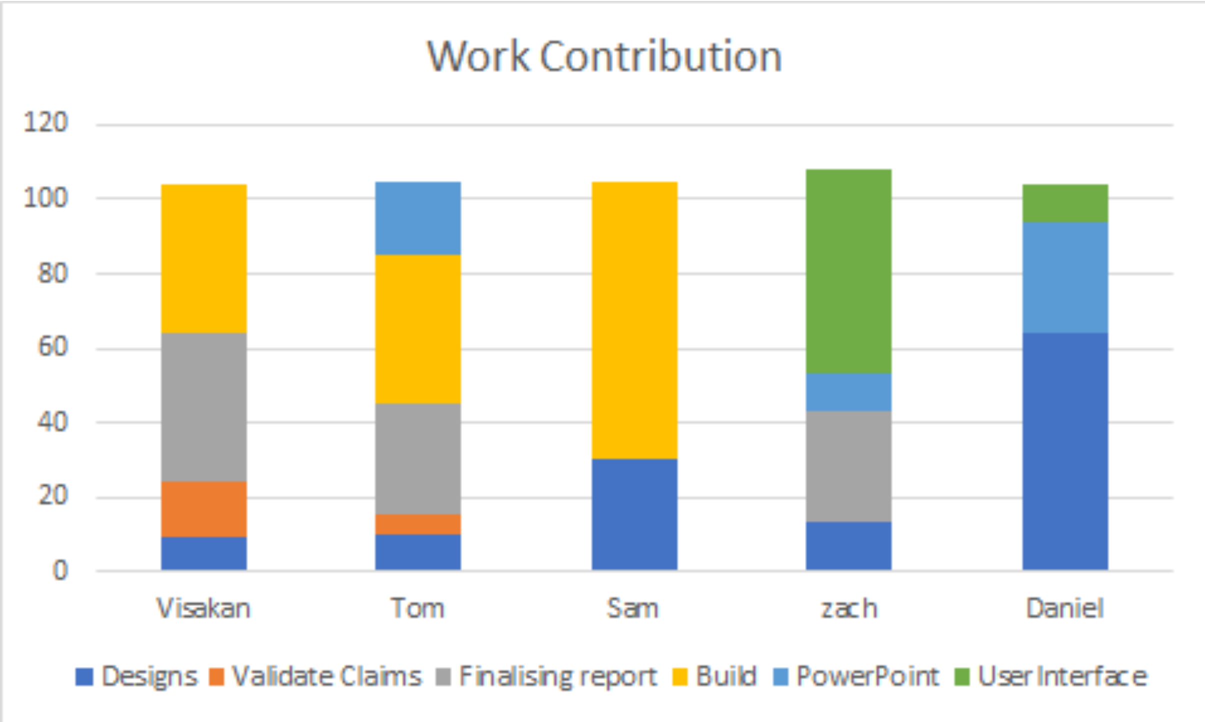


Figure A : A graph showing the distribution of workloads between team members

Figure B: Pobo Side View