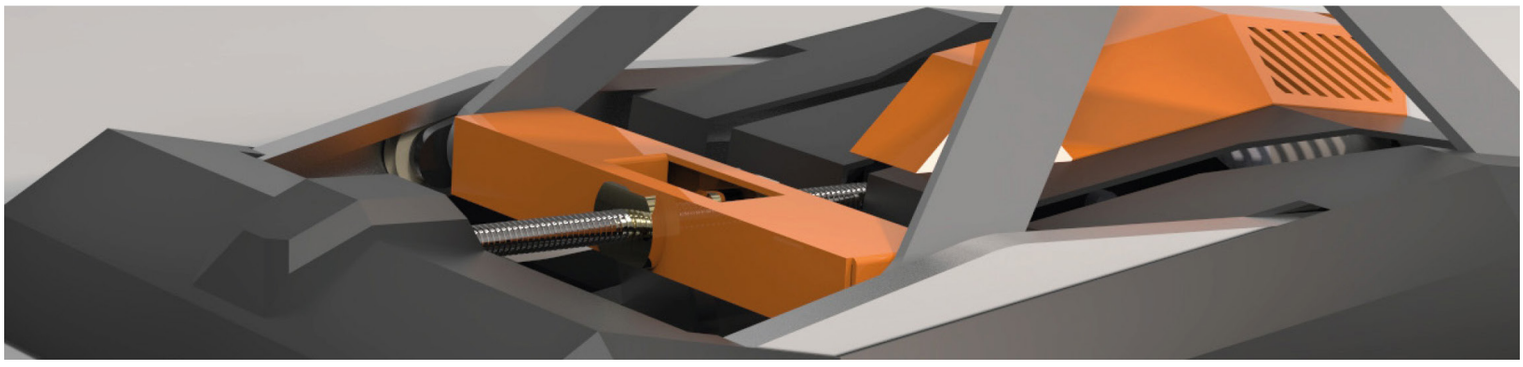
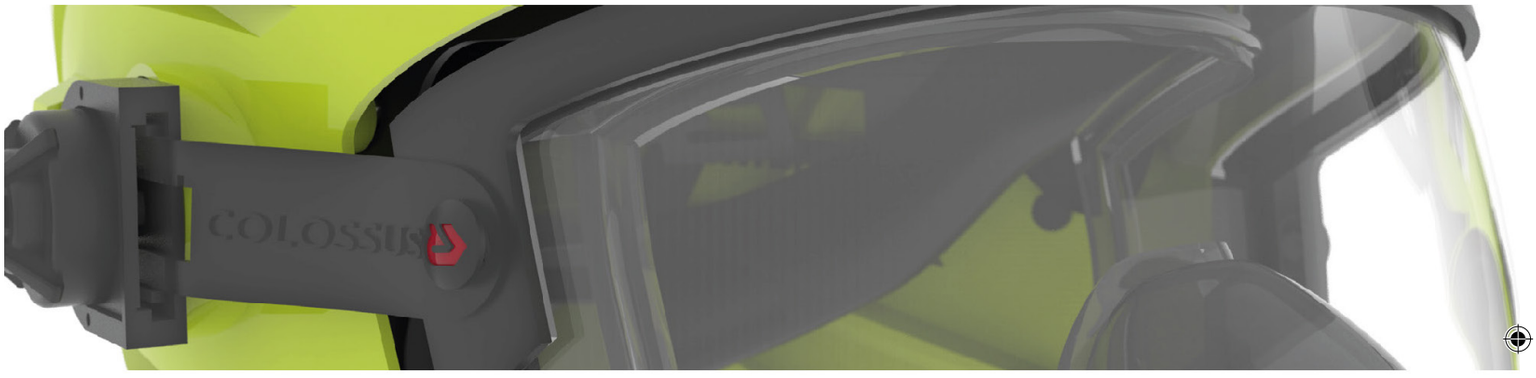




-DIALOGUES-IN-
-DESIGN-INNOVATION-

DMU:Design-Products Graduation Projects
Product, Furniture & Industrial Design *innovation*
De Montfort University

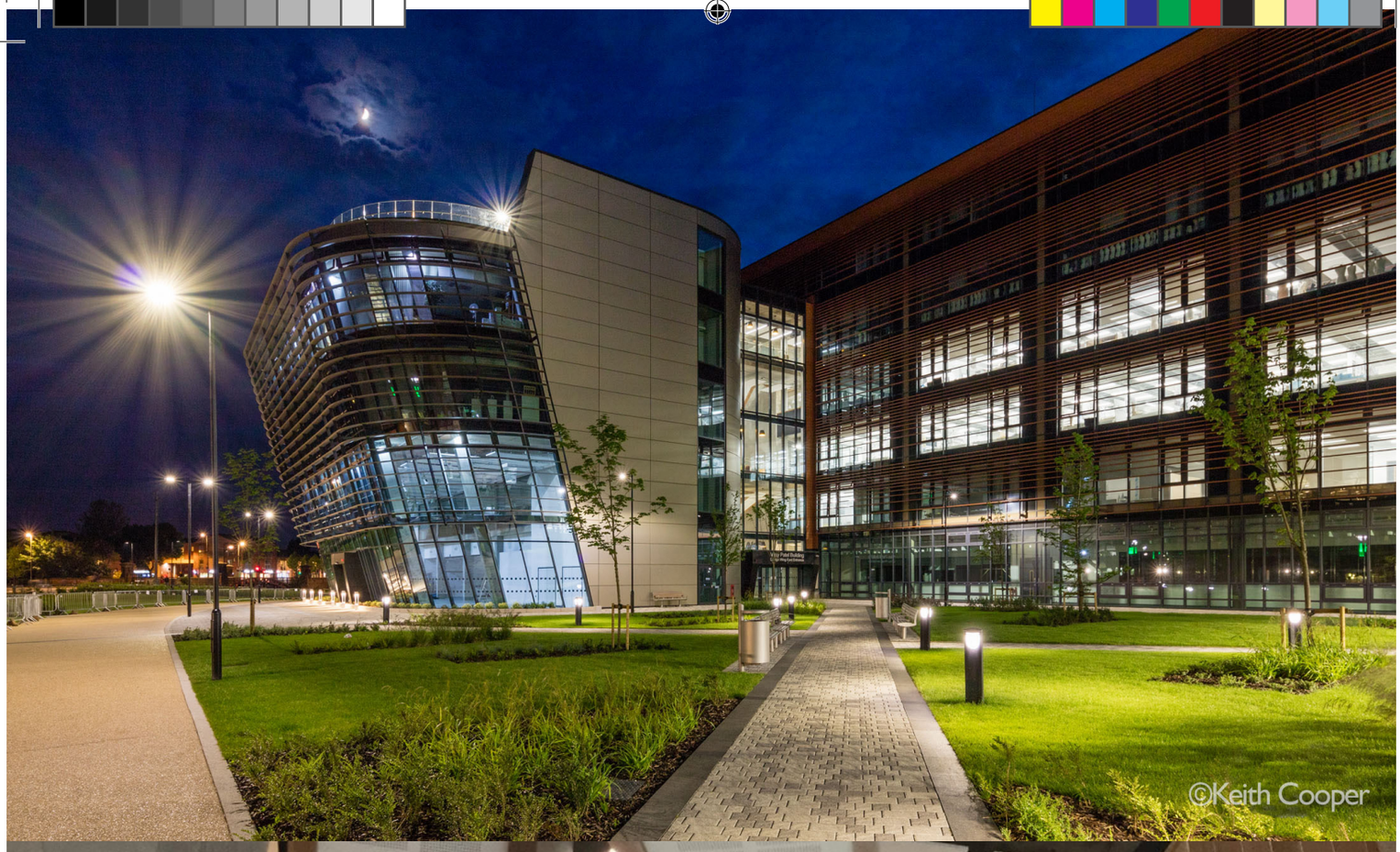
DESIGN PRODUCTS

Product, Furniture & Industrial Design at De Montfort University

TEF Gold

iED

BIDA
service • interaction • product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contents

Design Innovation at DMU
Design Products

Welcome to 'Dialogues in Design Innovation' the current edition, a celebration of the projects undertaken by students in Product and Furniture Design at De Montfort University. These projects represent a breadth of approaches, subjects and outcomes reflecting the expert provision of the department. Staff and students' research and product solutions are pertinent to the lives we live today, such as the impact of an ageing population or First and Third World health provision – underpinned by the consideration of environmental and economic sustainability. Student studies are categorised by their Programme emphasis. Projects are undertaken in both areas of the Arts and Sciences with students choosing an approach, which emphasises their studies, from the visually creative to the overtly technical. Students can choose to practice within specialist areas of both Product and Furniture Design.

Each study programme emphasis's research tools, design business and emerging technologies, within the context of professional practice. Projects range from tackling the challenges of communications across different generations through to rape prevention schemes in refugee camps. Each project is differentiated by a key theme and comprehensive research methods are employed to emphasise genuine insights into people's behaviours.

The range of Programmes within the subject of 'Design Products' are designed to address the needs of both international design business and our students. Students join us from a variety of backgrounds, cultures and countries. Students can choose, within the Programme, from a choice of options including a year industrial placement, or an 'exchange' year with a European university (though ERASMUS)

Our approaches to the design process ensure that new insights into problems are recognised and are subsequently resolved. The act of 'designing' in itself is also questioned as staff and students review the role of consumers within the design process. This allows them to become actively involved through a co-design process and helps to determine the product outcome.

Our Programmes' emphases upon employability is reflected in our commercially sponsored projects, our work placements and involvement in national competitions. As this book shows, students have been involved in projects with key brands manufacturing companies

Commitment to the IED and BIDA professional guidelines brings a commercial context to students' studies. They have undertaken placements with the likes of BMW and Bluefrog Design and won competitions set by organisations such as the RSA and DIIP

The link between academia and the design industry is further strengthened by the work of our Design Unit, our umbrella initiative for commercial and research design activities. The recently completed Vijay Patel Building facilitates proactive study research activities into additive manufacturing, design research methods, resource efficiency and retail design. Staff are not only active as 'researchers' but also undertake commercial 'interventions' to improve the competitiveness of the region's businesses. Over a 10 year period more than 120 projects have been undertaken attracting in excess of £4.5 million. These activities are important in that they inform our design curriculum and ensure that students are taught by practicing designers and researchers. This work also makes certain that our staff are categorised highly within national Research Excellence Framework (REF) with projects being classified at an international standard.

This edition demonstrates the breadth, ingenious and thoughtful projects which our students produce.

Following the broad theme of four design Challenges students negotiate the focus and intent of their graduate year projects. These projects are both th summation of three years of study and also serve as bridge into the career market.

Stuart Lawson
Associate Professor Design Products
Faculty of Arts, Design and Humanities
De Montfort University

Grand Challenge #1
Ageing Population

Within the world's non-developing nations and in particularly the G7 group of economies, people are having fewer children and living longer. This exponential demographic change and the fiscal certainties that it brings, will form one of the grand challenges to these collective society's wealth and pre-eminence over the coming decades. Currently, one in six people in the UK are over 65, but by 2030 this proportion is expected to be one in four, with the over 85s being the fastest growing sector of the population. The predicament for the UK is that in relative terms, fewer people are paying taxes whilst more people are reliant on pensions, healthcare and the support of the state; which as a financial model manifests a greater danger to individuals' personal wealth and the UK's economic surety than any legacy of profligate investment banking.

The population's increased life-spans are mainly attributable to improvements in working conditions, diet, medical interventions and housing. However, the UK's new demographic destiny means that such progress can no longer be relied upon. The challenge that governments, science, design and society must face is how to provide, on a much reduced budget, a standard of healthcare, products and support systems for its ageing population that are comparable, if not better, than anything that has been available during the 'Long Boom'.

As well as being expensive, ageing is also risky; for women and particularly for men, increased years in life expectancy are likely to be spent in poor mental and physical health although research has found that such difficulties are not evenly distributed amongst populations, with regional and local variations in life-spans of up to 15 years (related to factors such as earnings, employment and lifestyle). Applied research into enhancing mobility and independence for the elderly also has many parallels with the needs of the disabled (although they are not necessarily related even though disability levels increase with age) and a growing awareness of this has meant that socially inclusive design is increasingly recognised as a fundamental part of good practice and of the conscientious development of new product and new services.

Engineering and design research over the past decade has also made great advances in assistive technologies and systems, enabling people to stay independent and in their homes for longer. Within the science community there is also a burgeoning understanding of the mechanisms for improving cognitive function and for creating mental wellbeing in later life, with research, products and systems establishing that physical activity, work, social networking, plus cultural and community engagement are all good for improving individuals' quality of life in old age.

The challenges and opportunities presented by an ageing population are also increasingly seen by business as a key opportunity for innovation and enterprise which although not directly a solution for the demographic deficit, is a vital part of the collaborative strategy needed for its resolution.

Grand Challenge #2
Health & Wellbeing

Technological innovation and highly developed economic and organisational structures have allowed Western societies' citizens to become largely detached from the struggle for the basic necessities of life; food, water, shelter and safety. Yet, concerns over personal health are inescapable and even though medicine is increasingly able to improve and preserve peoples' lives, factors such as the ageing populations, obesity and drug-resistant viruses present enormous challenges for science and society.

Health services face many challenges one of the most pressing is the rise in Healthcare-associated infections (HAIs). The Department of Health have announced that 1 in 10 patients acquire HAIs and as a result they stay in hospital 2½ times longer than required. This has a tremendous human cost but also places great financial pressure on the NHS. Highlighting of HAIs in the media has led to this becoming a political issue and a health priority. Good design can help make hospitals safe by developing furniture and equipment that's easy to clean and also challenges the behaviour that prevents it from being cleaned or promotes the spread of infection in the first instance. The Department of Health and The Design Council challenged the UK design community to tackle the issue of HAIs. The result is a testament to the power of design thinking and it is a model of how design is liable to be procured, tested and developed in the future.

"It was fascinating because we had all the knowledge and they had all the talent and being able to merge the two was invigorating" (1).

The number of obese people in 2005 was around 400 million; this will balloon to 700 million by 2015. "The demands of age-specific ailments will increase on healthcare services and support agencies as the proportion of the population over 65 increases from 7.3% to 9.4% by 2020". (2)

Bigger challenges face us still. While the "OECD (Organisation for Economic Co-operation and Development) countries spent nearly $3.5trn in 2005 which could rise to $10trn per year by 2020" (2), demand for healthcare treatment for chronic conditions is also set to soar in the E7 countries (China, India, Russia, Brazil, Indonesia, Mexico and Turkey). Their GDPs "..are set to triple from $5.1 trn in 2004 to $15.7 trn; by 2020" (2) and these will be significant new markets for health. Whilst national, regional and cultural factors help shape the severity of how much external forces impact on our personal health, we still share common global themes.

In times of great change there are also great opportunities for design, which in partnership with science and technology will shape the health and well-being of future generations.

1 – Paul Cryer, HCAI Technology Innovation Programme Manager, Department of Health. Design Bugs Out Report: Design Council 2009

2 – Technology Strategy Board Report Medicines and Healthcare. Strategy 2009-2012.

Grand Challenge #3
Sustainability

Sustainable Development is a concept that has developed since the 1970's. The public and governments started to understand and worry about the effect of human activity on the environment, the potential consequences of depleting resources for future generations and the permanent damages we caused to the planet. It was understood that the rate of resource depletion was directly linked to the increasing production of goods needed to satisfy our consumption patterns. All agreed that such a rate of resource depletion combined with a growing population was creating an unsustainable way of life. As the World Commission on Environment and Development defined it, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987, p. 8).

The emergence of sustainable development has created great repercussions in design and product development, both in research and industry, through the discipline of sustainable design. The take-on of these issues in industry was caused by increasing external pressures; such as legislation, media, scarcity of materials, rise of oil prices, environmentally more aware consumers, etc. These issues have challenged businesses to integrate environmental and social concerns as new performance criteria alongside their financial criteria. And in order to manage performance all across products' life cycles, product development teams have had to combine sustainability with supply chain design thinking.

In research, many focus on developing tools to help the identification of environmental aspects, the selection of materials and the screening of design concepts. Research also concentrates on case studies or "success stories" to illustrate the potential of sustainable design. At De Montfort University, we have been investigating sustainable design for many years, running various research and commercial projects in this area. Also, as a fundamental part of our education model, the students benefit from the gathered knowledge and expertise through our course and the use and learning of latest software, equipment and involvement in real industrial projects.

In the development of products, sustainability is a concern for the whole supply chain (designers, engineers, manufacturers, retailers, etc) but the choices product designers make in regards to sustainability and collaboration with the supply chain are pivotal to change the way we produce our goods. Only this approach, alongside designers' creativity and ingenuity, will provide sustainable design; or as some practitioners call it, GOOD DESIGN.

Grand Challenge #4
Society

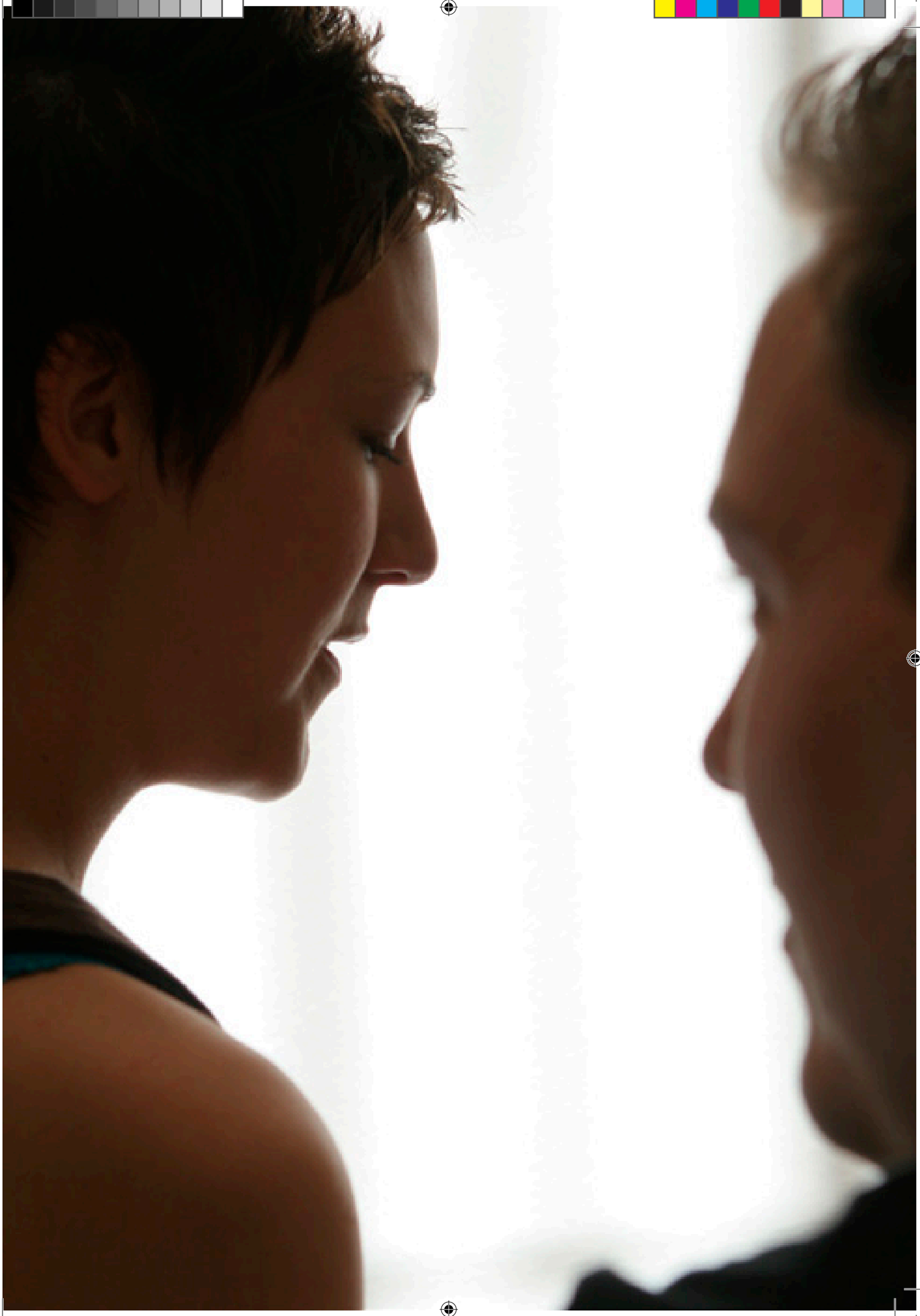
The exponential growth and advancement of information and communication technology presents society with many opportunities, but what must be mediated by designers is whether the activities created, replaced, or enhanced by such technologies produce societal improvements or just change without eventual benefit; "...as people incorporate these emerging technologies into their social interactions, there results a tendency to lose touch with social nuances, cultural values, and the characteristics of traditional society." (1)

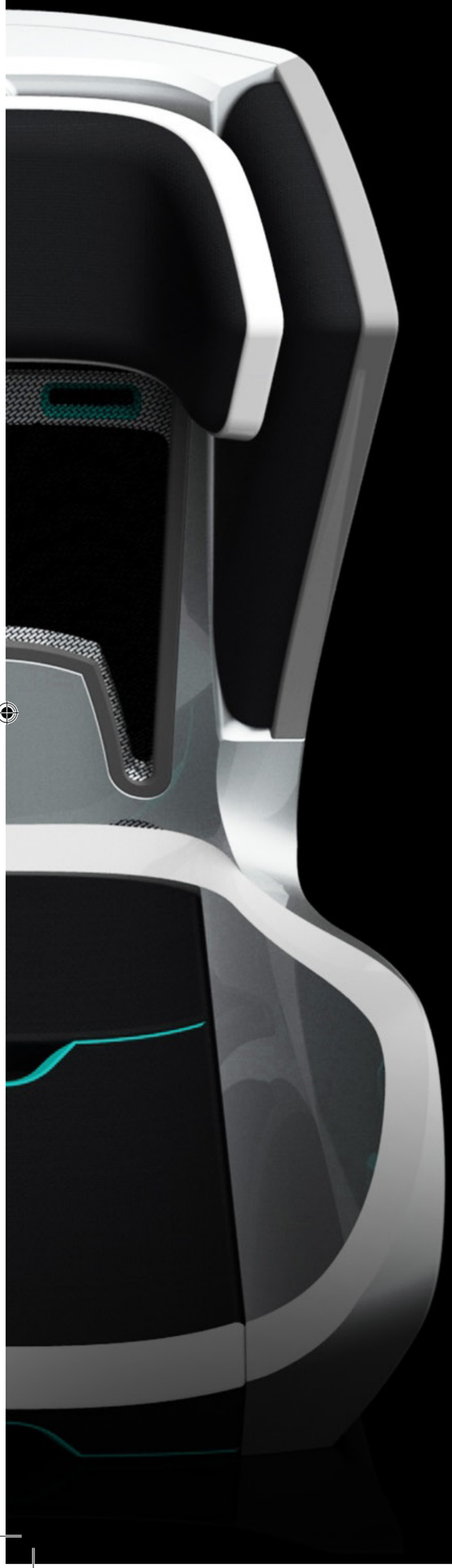
The integration of these maturing and emerging technologies into personal, local and wider communities can create a reliance by their providers on their use that currently at least, can be a barrier to their success. However, older generations who didn't learn through processor-based technologies are being supplanted by those who recognise and welcome the opportunities presented by assistive technologies and systems.

As public service funding is cut, in parallel with an agenda for constant improvement in services and social cohesion across the generations, product and system design is increasingly seen as a solution for delivery; not just technology as a means of information retrieval but also as a facilitator of interactive dialogue,. As well as making personal engagement with geographic or issue-based communities much easier, the opportunities presented by information and communication technology increasingly makes it easier for individuals to reduce their carbon footprint and to stay connected to family, friends and support networks, particularly in later life.

In order to be effective, designers must comprehend how their designs work in a social context. To do this they must understand the expanded definition of their design discipline as sustainable design, service design, interaction design, user-centred design, and designing for social networks. In an age with dwindling resources, with more of the population than ever before living longer, where social cohesion, societal and cultural traditions are under threat, designers need to provide more for less, fostering change and positive behaviour whilst also considering what they do in a broad social context.

(1) Social Interaction Design in Cultural Context: A Case Study of a Traditional Social Activity. Ko-Hsun Huang and Yi-Shin Deng, 2008. The International Journal of Design





EVOGRÓW

THE ADJUSTABLE SLIM LINE SAFETY CAR SEAT

-BAHons-DESIGN-PRODUCTS-GRADUATES-

-2017-

DMU:Design-Products Graduation Projects
Product, Furniture & Industrial Design *innovation*
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APIS - Beehive for Modern Living

'If the bee disappeared off the Earth, man would only have four years left to live.' Albert Einstein

Across the world there are over 20,000 types of bees, each varying in size, nesting habits and effectiveness as pollinators of certain crops. If bees were to become extinct, the effect on the human population would be catastrophic; one third of human's food supply is pollinated by bees. Without these important insects the longevity of human existence is limited.

In recent years, the reduction in UK honeybee (Apis Mellifera) numbers has become a serious topic of discussion amongst bee-keepers, farmers and scientists alike. The cause of this is a combination of environmental factors, e.g. harsh winter months (a study in 2014/15 reported 14.5% of colonies had perished due to colder conditions – an increase of 4.9% from 2013/14), increased urbanisation, the decrease in numbers of property owners with garden/green area, the use of pesticides and insecticides on farm lands and also diseases affecting the honeybee population.

To address this problem Olivia Alexander, a third year Product Design BA (Hons) student at De Montfort University, has researched the way we interact with bees and their hives and has put forward contemporary bee-keeping solutions.

"I wanted to move away from the stereotypical boxy, wooden beehive that has been around for generations, with minimal design changes since its creation. By changing perception of bee-keeping and honeybees we, as communities and individuals, can help raise awareness through engaging the public and aim to eradicate the causes of bee population decline."

Through a series of interviews and site visits conducted with the Leicestershire and Rutland Bee-keeping Association, Olivia gathered first-hand research about hive maintenance through controlling temperature and ventilation. She also learned about the difficulty of lifting a super/brood full of honey, and also about bee-keeping accessibility issues, both of which particularly affect the disabled.

To further widen her knowledge of the public's view of bee-keeping, Olivia conducted a series of online surveys in which she asked a broad cross-section of UK respondents about their thoughts on a proposed new beehive project, and whether they

would be prepared to plant bee friendly flowers in their gardens or on balconies/window boxes.

"The responses from the survey were amazing, and it was really encouraging to see so many people be(e) positive about wanting to help and make a difference to the bees' future."

When asked if they would be willing to be involved in a community hive, one respondent answered-

"Saving the odd bee isn't enough. We need to increase numbers significantly and quickly. Would also be great to involve school children to educate them about the importance of bees."

"Of course some responders were a little apprehensive at the idea of being surrounded by large numbers of bees, especially those with allergies. But those same people also relayed that they would be willing to plant bee friendly flowers in their garden to help with pollination – every little helps!"

A key moment in Olivia's research came when she contacted Ted Dennard, founder of the Savannah

Bee Company in the United States, who sell bee by-products and promote bee-related education programmes for schools and the general public.

Ted's enthusiasm for her venture and willingness to share his knowledge and passion for bee-keeping and bee conservation inspired Olivia to see the global potential of her project. With all her research complete she was now able to begin the creative process to formulate a new hive design to address the bee-keeping issues she had uncovered.

Enter APIS.

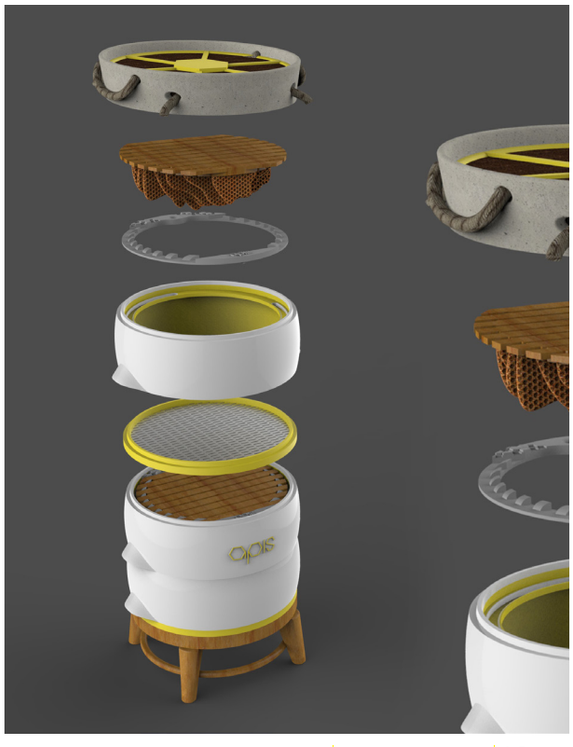
APIS is a compact contemporary beehive made from eco-friendly materials such as cork, wood and rope, which is designed to be integrated into urban areas to encourage a new wave of bee-keepers by creating a stress free habitat for the bees.

By improving the user experience and interaction with the hive, APIS allows the bee-keeper to have a smooth interaction with the bees. APIS' unique internal rotating mechanism allows quick and easy repositioning of the internal frames, which enables control over ventilation and the temperature of the hive, according to preference and season. APIS also supports the creation of a truly individual hive as its design is compatible with both commonly used 'top bar' and 'national' frame styles.

The APIS innovative design consists of three rotationally-moulded sections with two interchangeable lids, enabling the configuration and size of the hive to be customised to suit the needs of the bee-keeper and the bee colony. This flexibility in determining section height allows the user to stack the supers/broods to a height that allows easy access to the honeycombs. Integral rope handles enable users to lift and move sections easily without fear of dropping them and injuring the bees or damaging the frames. One lid option incorporates a planter for bee friendly flowers which provide pollen and nectar close to the hive. The removable planting divider allows the user to place a water source amongst the plants to ensure the bees stay hydrated.

APIS is aimed at local schools, councils and community groups with the idea that organisations such as The British Bee Keeping Association would become involved to provide time, knowledge and resources to support this new venture. The opportunity would then exist for interested individuals to subsequently purchase and maintain their own hives.

"To ensure the survival of bees we must adapt hives, the space around them and the way we interact with the colony to prevent their decline."



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EVO GROW

- adjustable child car seat

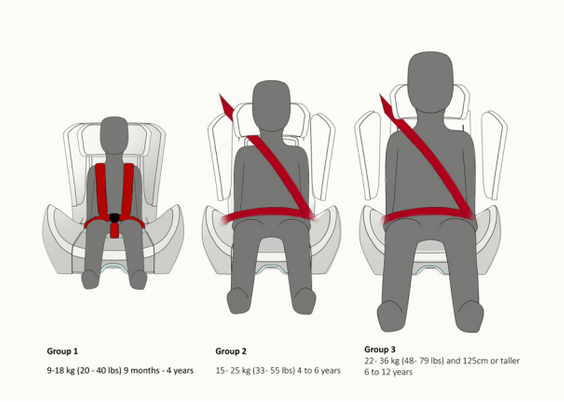
Inspired by my passion for automotive design, I chose to research for opportunities for innovation in the automotive industry. Including road safety concerning drivers and pedestrians.

During in-depth research, I came across a gap in the market regarding child safety. “Younger road users under the age of 3 by law do not have to ride with restraint within commercial taxis.”

Why was this the case?

Through thorough investigating of the car seat industry, I uncovered issues within the current market. This presented an opportunity for new product development.

A child travelling within in a commercial vehicle and travelling safely in a car seat isn’t something that you would expect to see. Mainly because you don’t think that taxi drivers should or would have to store all the different sizes of child seats, within their vehicle. Many toddlers are therefore then put at risk and put in danger, only because of sheer inconvenience , is the word of parents, taxi drivers and automotive safety experts. A simple product



could allow this problem to be rectified. This also opened up much scope for a new product. A product that had ease of use and adapted to its surroundings. In addition, it could address the change in the market concerning brand culture.

The idea that taxi drivers found the use of safety car seats as an inconvenience to use as part of their business was the first problem that needed to be solved, as this allowed an unsafe law to still be in power. Researching the reasoning behind this, found the outcome to be partly blamed on that there needed to be a different size or range of car seat for all the different age ranges, weights and sizes of children.

To keep all these seats, agreeably would be an inconvenience. It was an unsustainable design for the existing products. Product users would have to buy the different group of car seats that fit the correct weight and size of their child at any one time.

There was no adjustability that boasted such a wide range; there was minimal regard for the form of the product, when it came to adaptability. There was also no push for change regarding the brand culture.

After researching the main competitors; Maxi Cosi and Britax (which were also ones that were primarily in the beginning stages of consumer research) all had minimal regard for style over function and had no real push for something innovative, that pushed the boundaries of the design industry when it came to safety products. A product that has a guaranteed customer doesn’t necessarily have to push the

boundaries of design and be enterprising. Existing products, however still did have faults that were apparent when undertaking market research.

Customers found the product 'bulky and hard to use', it was a task to transfer the seat to different cars, and to change different settings on the seat. For example when changing the height of the straps, it meant taking the whole car seat apart, as well as it was nearly impossible to fit three car seats side by side, because they were so large.

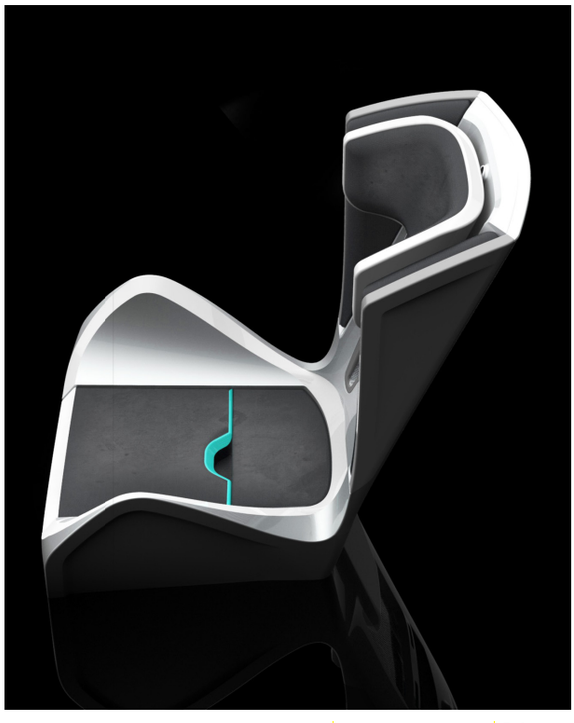
There was an assumption that this was to be expected as this meant the car seat to be safe and a guarantee that their child would be protected. However if I adapted this idea and created a new safety seat that improved the functions but also to improve the image would be a solution.

The main solution for the brief is to create a product that is highly convenient for the potential users i.e. parents. Inconvenience has been found to have a serious effect on the safety of children, and has created contradictions in the law.

To construct a safety car seat that would therefore be adaptable to its surroundings and still be user-friendly would certainly allow these issues to be resolved. To design and create a safety car seat that is adaptable, light and compact enough without interfering with its safety aspects and whilst always complying with safety regulations.

I therefore designed a car seat that has considered all these aspects and created, The Evo-Grow. It stands for Evolution and Growth and is an evolving child's safety car seat. It has been designed for the use within commercial and personal vehicles; it can adapt to a child's age and size, and has a massive age and adaptability range of 9 months to 12 years.

It's a product that has improved attributes of product sustainability, because of its exceeded life span and influences the safety car seat market concerning brand culture. I believe it has a concept that pushes forward the boundaries of style and design with regards to a safety product on the open market.



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PROTECHSPORT

Snow sports are a widely popular and profitable industry, enticing huge crowds from all over the world. Every season skiers flock over aiming to push their skiing abilities to the limits as they challenge and chase the dream of the perfect run, while also immersing themselves into the mountain culture. For most brits this consist of a copious amount of beer and wine, in which Dutch courage often leads them to believe in their 'brilliant skiing ability'. Millions take to the slopes each season, creating income for surrounding areas of over a £1,000,000,000. This begins to portray the love for this sport and the impact it has to boost the economy of its area.

As an extreme sport, the downside to all of this boils down to the safety of its participants. With no actual rules or laws on the slopes stating the need for safety equipment, it's not hard to believe that a wide majority neglect the use of it.

'During the ski season 2015-16, SOS International's alarm centre, doctors and nurses assisted more than 1,700 injured ski tourists from Denmark, Sweden, Norway and Finland.'

It's thought that around 50% of these injuries could have been prevented through the proper use of safety equipment.

'Traditionally, the knee is the part of the body that is affected the most, when an injury puts a premature end to your skiing holiday. Knee injuries account for almost twice the number of injuries to the lower legs, ankles and feet, which rank second on the list of the most common skiing injuries. The lower part of the legs are affected more than the entire rest of the body. Injuries to knees and downwards account thus for 55% of all skiing injuries'

While safety equipment worn in the sport has risen in recent years and the improvements in equipment's overall performance has increased, certain areas of the body have been neglected, leading to a rise in certain injuries. 35% of all ski injuries now affect the knee. Increases in the performance of ski boots and bindings has led to injury torsion and impact forces that would have previously affected the foot, ankle and shin are know all channelled through the knee creating this concerning statistic.

Common knee braces for skiers aim to rehabilitate and aid recovery in previously injured ligaments and muscles. These braces are often bulky, ridged, scaffold like structures that are a massive hindrance on a skier's ability, restricting their movement and overall enjoyment. While the majority of braces on the market aim to rehabilitate, The 'PROTECHSPORT – Prevention Brace' aims to prevent injury before it happens.

Main Project Triggers

The core design factors and project triggers centre on ergonomics, usability and project brand culture. Design for Ergonomics – detailed performance factors- I must achieve these functions

There are points of rotation and extension toward which the knee joint should not go past, otherwise moderate to serious injury will occur. It is these ergonomic metrics in which the product will effectively restrain and so prevent the risk of injury.

The comfort and fit of the brace in relation to the knee form is a vital element, creating a structured form that clings to the leg/knee and is therefore unnoticeable as possible. The Brace aims to be breathable and moisture absorbing, creating the optimum level for wearing comfort throughout the day.

Design for prevention of injuries

The design for prevention aims to stop movement at a controlled rate before the injury zone is reached. The current market is saturated with rehabilitating braces that create a ridged structure that hinders user ability while skiing. Creating an

injury prevention brace rather than a rehabilitation brace gives far more freedom in design allowing the braces overall form to be improved in its free moving and non-restrictive nature, not having to adhere to the strict rules and refinements of setting the knee joint firmly in place, obstructing the regular range of movement needed from the joint.

Brand Design Factors for Emotion

The emotional design behind the preventative brace is to remove the stigma round knee braces being ridged, restrictive and unattractive. The appearance of these scaffold like structured braces immediately highlights 'Health and Safety Equipment' creating an unappealing aesthetic.

The preventative brace redefines product technical performance, product culture toward technical sport accessory, easy and comfort of use …. Light and yet highly protective. The preventative brace promotes 'safe skiing'.

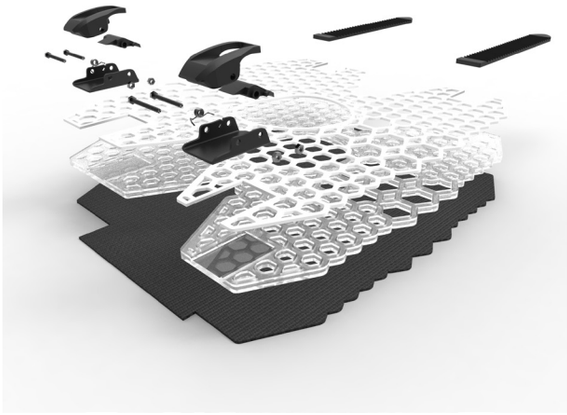
Design for Usability

The design for usability of this product comes in the form of its free moving and selectively restricting to avoid over extension. The usability is at its best when the user is able to ski to their full ability without being affected by the brace, allowing them to have the confidence and safety in knowing their knee is protected.

Technical sports accessory – specific for the key performance requirements, limits and context.

The product will not be able to stop catastrophic injury and has been designed to fail at a certain force strength. The brace in rotation reaches a point of which the structure cannot deform any further, at this point if the torsion force begins to twist further, the brace will buckle. Bearing in mind this torsion force would still have to be very high and realistically would only occur in a major injury situation. If this feature was not thought about and the product restricted all over rotation then problems would then be transferred to the groin area and would not be solving a problem, simply creating a new one.

Technology Factors New Material and Componentry Design



The preventative knee brace redefines material and component technologies previously used in existing products. Improved performance, reliability, reduce weight, improved wearability, enhance product bard culture. Uniquely configured flexing mesh lattice, encapsulated in a silicon substrate – which emulates the physiology of restraining ligament and stabilising muscle – providing freedom movement and yet support and protective restraint when critical joint rotation and extensions is reached. The advances in materials used in the brace has created a resistant and protective, but flexible and free moving brace.

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Canary-resparitory protection

If sewage excites you then you're in for a treat! Adam's interest in sewage management led him to investigate issues of health and safety in the sanitation industry. It is estimated that there are over 1.2 million sewage and sanitation workers in the UK alone. Working around open sewage can expose these workers to extreme risks including the inhalation of dangerous gases, and smelling like crap.

In Wastewater Treatment Plants, this is a huge issue (the inhalation bit). Wastewater Treatment Plant Operators have the unfortunate responsibility of monitoring operating conditions, including the task of adding disinfectant chemicals – such as Ammonia or Chlorine - to the water. The anaerobic digestion of organic matter and purification of chemicals in the water – methods used to cleanse wastewater for its return to the water cycle – can emit harmful gases including Ammonia, Methane and Hydrogen Sulphide.

Workers rely on gas monitors to instruct their evacuation from harmful gases emitted by the digestion of organic matter and purification of chemicals.

Exposure to these gases can result in immediate health deteriorations including: nausea, dizziness, lack of coordination, respiratory irritation, eye irritation and, in extreme volumes, suffocation and death. The production of these gases is unavoidable, so permanent operators must depend on reliable gas detection and respiratory protection equipment – of which it is the employers' responsibility to provide - to safeguard their health.

Existing protective measures currently involve the use of a personal multi-gas detection monitor that alerts workers and advises evacuation after the detection of gas or oxygen deficiency (which basically functions on the basis of: if you hear the beep – run like your life depends on it, because it does). Workers can carry emergency respiratory equipment with them to be worn after instruction from their monitor, but this leaves them vulnerable to gas inhalation in the period between detection and protection or evacuation. This is a problem that demands the introduction of a system that eliminates this period of dangerous exposure to harmful gas (enter: The Canary).

The maximum exposure limit of Hydrogen Sulphide is 20ppm, equal to 0.002% concentration in the air. Minute deviations in concentration can leave workers vulnerable to exposure between detection and evacuation.

The Canary Full Face Respirator Mask, named for the use of canaries by miners up to 1986 (shockingly!) to detect dangerous gases. It is a device for respiratory protection on Wastewater Treatment

Plants that acts only following the detection of dangerous gas. A locking filter mechanism is controlled by a gas monitor inside the mask that continually draws in and tests the ambient air faster than the rate of inhalation. Visual and audible alarm signals alert co-workers, affording a valuably safe evacuation period to escape an unsafe atmosphere.

The Canary completely eliminates the period of dangerous exposure to harmful gas.

The concept of a filter mechanism that responds directly to gases in the surrounding air by incorporating sensor technology is brand new in the respiratory market. The applications of this technology are too many to list, these could include: protection from asbestos in the construction industry, protection from unpredictable gas release during pharmaceutical testing, and work in confined spaces including mines and cargo ships.

Incorporation of sensor technology is brand new in the respiratory market.

A high-end evolution of the system might incorporate the addition of an oxygen supply. High concentrations of Methane can displace Oxygen in the air and reduce its concentration to below 19.5% (the minimum concentration for safe breathing), so an oxygen supply would allow workers to breathe normally whilst they escaped to a safe atmosphere. Sewage workers would surely welcome collaboration with Febreze as well (let's put a pin in that idea).

Industry leaders in respiratory protection have commended the Canary concept:

Steve D'Arcy, Sales Representative at Sundström Safety said; the mask is "a clever and original concept with potential to disrupt the respiratory safety industry".

Philip Hague, Senior Design Manager at The 3M Company said; "the attention to detail is impressive".

Greg Barber, Product Manager at Draeger Safety UK said; the concept is "a great idea with many potential applications".

The alternative use of existing technology creates a differential with the potential to disrupt the respiratory market.

The Canary is a good example of the simplification of sophisticated technology, assisting the transition of the respiratory mask from a purely functional tool, to an empathetic piece of protective equipment. The concept, which explores the alternative use of component technology to generate market differential, ultimately disrupts the respiratory market, and does so with style and redefinition of brand culture.

The conceptual development of improved key performance metrics, enhanced usability and a distinguishing product culture is quintessential of Adam's work style, and is represented clearly by his project portfolio.

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MHV3 *-mobile low pressure water system*

A low pressure, water based cleaning product enabling improved car cleaning in an urban environment.

This article covers the initial starting point of the project to convey the underlying project triggers. These formed the basis and are the driving force behind the development of the MHV3. Also contained within this article are the design methodologies employed through the project and where I see the MHV3 in the future.

Setting the Scene

Imagine this everyday scene: you want to clean your car which is parked outside your house.

You then have the troubling task of trailing long runs of hoses and power cables before you even start the cleaning. Then, after their use you have the task of packing them away until the next time.

These hose pipes are never quite long enough, resulting in fighting the hose to just finish washing down the last suds.

In addition, you're always a bit weary of using the high pressure cleaner, the water sprays everywhere soaking you, the house and the neighbour's cat.

Market Competitors

Within the mobile cleaning sector there are already a few established models. Focusing on mobile water based cleaning products, there only a handful of mainstream models. In general terms they focus primarily on ease of use and manoeuvrability, generally small scale, car boot size. However they tend to sacrifice performance over time and adaptability to multiple situations.

Product Purpose

So why am I asking you to imagine that typical weekly scene? Well the MHV3 will allow the user to have a mobile low pressure water system. [See image 01 for test rig, 03 for product concept.] The most notable product features;

Output pressure of that similar to a nominal garden hose.

The 12 volt system also ensures the users safety during the use

Combination of a battery enabling complete mobile unit

The water reservoir contains roughly 70 litres of water, enabling a continuous work time of 40+ minutes.

MHV3 will allow the user to have a mobile low pressure water system.

Working test rig to prove underlying concept

Project Triggers

When I use the term project triggers, this refers to the initial driving factors behind the project work-flow. During the project I had a main focal point - market: focusing on the evolving market sector of mobile cleaning. This initial sector lead on to the User Interaction (UI) & User Experience (UX), which then fed into the Consumers and Brand.

Market

The project started in the analytical break down of the current jet washing technologies; their advantages and short comings. There is an emerging marketing trend towards low pressure cleaning products. This marketing cliché is a growing part of the cleaning sector within the United Kingdom and during the presentation to Karcher, I received feedback that the MHV3 was "On key with emerging market" Karcher 03/2018. This market positioning lead onto the UI & UX and Enterprise.

"On key with emerging market." *Karcher 03/2018*

User Interaction

During this project I employed Human Centred Design Methodologies (HCD). At the start this took the form of evaluating the current market competitors in terms on their performance against current user interaction (UI). [See image 02 for context]. By analysing the current UI it helped define the problematic areas with cleaning products and more importantly how they can be improved. This key point led onto the conception of the MHV3.

Insight into UI through HCD methodologies

Enterprise

In essence, the enterprise directly relates to the market, the MHV3 is a new product with few to no market competitors. This fact combined with an establishing business could result in a start of a successful product range.

Brand

The choice of brand alignment was a deliberate one on my behalf, I chose to focus on the Karcher brand. The rationale behind this decision lay in the fact that they, as a brand, are the leading identity

and supplier in water based cleaning products. In addition their embed enterprise model with 95% of products under 5 years old. To align the MHV3 with the brand values of Karcher I added the Indicative Emotional Design (IED) & the Brand Visual Language choices employed by Karcher into the product form.

Brand alignment through inclusion of IED

Consumer

As indicative of the market sector, the consumer is the main driving force behind the growing sector. Generally users are pushing for mobile cleaning solutions enabling 'cleaning on the go' or products that require less complex user interaction. With a trend in consumers wanting to complete more cleaning task by hand, this push for mobile solutions has never been more relevant.

Product Future Development

Even though this iteration of the MHV3 focuses on the use in car cleaning. There is also a definite viability in the development of a product range. [See image 01 for photo of current component technology layout test rig]. By re-purposing the component technology and product form, it could be reconfigure for more specific applications to other physical locations/uses.

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Verdé

What is your vision for the future?

Is it bright? Can you see our society moving towards environmental awareness, sustainability and collective responsibility for our global well-being and peace?

Or do you envision issues that humankind is now facing consuming us, tearing apart a whole nation as atonement for all that we have done?

You and me. We have a choice which vision we choose to embrace for future generations and how we approach the fulfilment of it.

"In the UK, we throw away 14.8m tonnes of food every year (Vision 2020, 2011) and 53% comes from the households."

More than half of the human population lives in an urban area. "In every part of the world cities are growing in size and importance. Urban areas are now home to over half the world's population and account for 80% of our economic output. They also consume 70% of our energy. Each week the global urban population grows by 1.4m people; the equivalent of a new Birmingham" (Green Investment Bank, 2015) The generation of food waste is increasing, and management of it has become a significant concern. In Europe, organic waste mainly comes from households with an annual amount of around 100 million tonnes. If there will be no shift in society, it is predicted that by 2020 this amount would rise to over 120 million tonnes (Stenmarck, 2016). Green refuse lands in landfills and produce hazardous gases, some of which are greenhouse gasses like CO2 (carbon dioxide), CH4 (methane) and N2O- (nitrous oxide) and ammonia, which have an impact on the formation of acid rains (Sánchez, 2015). Inappropriately managed organic waste has also impact on ground-waters pollution and contributes to wasting a unique opportunity to alter waste into a resource.

There is a way of transforming our waste into a resource, and Verdé is there to remind us of this truth. Verdé is aiming to challenge and redefine the relationship between city citizens and their organic refuse.

It is a design for behavioural change at all levels within city citizens, societal awareness and city management executives.

In city blocks with no access to gardens, people are not encouraged to collect and dispose of green waste, a by-product of cooking. In 2015, more than 4 out of every ten persons (42.0 %) in Europe lived in flats, and this figure is growing. Verdé addresses this need on the market. It is designed to store compost and prepare it for collection by the City Council. The bin will help the user to adapt the waste for anaerobic digestion on an industrial scale.

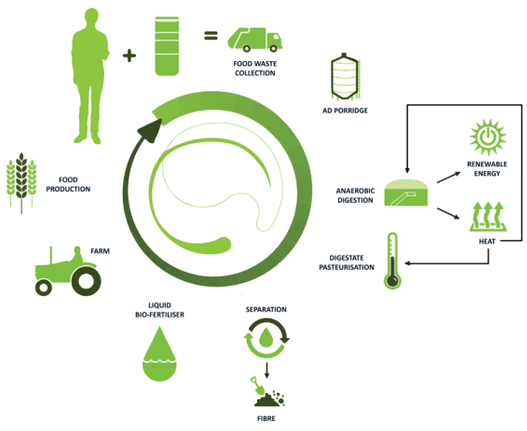
So what is the vision that fuels Verdé?

A zero-waste society that completes the natural cycle and uses instead of wastes, enabling users to transform their food scraps into renewable energy from within their own homes.

How?

Each user in the city block is collecting and preparing organic (food, vegetables, tea, plants) refuse for industrial-scale anaerobic digestion held by a city council and accommodated in short distance to reduce the waste transportation time. Waste shredded and placed in the digester opens the process of transforming our daily scraps into bio-fuels, clean electricity, heat and reach fertiliser that supports farming and food production.

(Graph showing the circular economy of food refuse management and Verde`s placement in the cycle)



Anaerobic digestion is fuelling the way to a greener, smarter cities.

The circular economy is inevitable, we can no longer afford to waste any resources on this planet. Progressing pollution of our soil, air and groundwater due to incorrect organic waste management in our current landfills is very harmful to our present and future population.

Our society needs to awaken to recall again that we are subject to nature. This once obvious truth has become forgotten due to our pride and hustle of materialistic world. Collectively we like to fool ourselves that we are better and smarter than forces of nature but a rapidly changing environment is proving us how foolish we are in this mindset.

Verdé is challenging city management by increasing the social awareness about waste and creating the need to move towards sustainable waste management strategy. Major cities of the world are facilitating this need of developing anaerobic digesters on the industrial scale. (Renewable Waste Intelligence Report, 2013)

Verdé throws the light on the ongoing succession of responsibility between city citizen and council. The project stretches the comfort zone and opens the dialogue path to encourage inevitable collaboration between bodies.

A dialogue that we all need to embrace.

The truth is overwhelming, that is why we prefer to deny the uncomfortable fact of how much harm we have made due to our pride and greed. We feel helpless when we think about "The Big Problems". What can one do?

Is one enough to make a change for better?

Verde's answer is YES.
One makes a difference.
You make a difference.

HOW?

The 21st century has changed the game. We have never before been so connected. Yes, we are seven billion people who produce waste.

But also we are 742,535,118 people in Europe only who want a better future. We are now a globalised population yet to become a community. Verde is part of this communal infrastructure.

Collectively we can make a change; together we have a global impact. When every person shifts one's mindset and environmental awareness we will have the most significant shift- that was never possible in humankind history before.

And Verdé is here to support you with this change. Verdé is here to enable you to make the impact that matters- on a global scale. Verdé aims to be a movement for a better now. Together we can make the change.

So what is Verde's future?

The future is the development of the product based on community feedback. From consumption to the curation of conservation. Verdé aims to facilitate needs of wide range of customers, yet it needs to be challenged by real-life situations. With the first-hand feedback, the bin could be adapted, improved and embraced by users.

Now let me ask you a question.

What is the link between a home-based station that encourages user in healthy cooking and waste collection and city council digester and waste collection system that will transport waste from homes to waste-into-resource facilities?

The missing element is human. Is it then about the product or about you?

The change will happen when we collectively stand on the green side.

Verdé- better future is here.

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Mercury Mask

Urban air quality, especially within major cities and Eastern areas such as Northern China, have high concentrations of particulate matter and gaseous vapors harmful to the human body. For example,

"Shijiazhuang, have recorded air quality of 1000 PM2.5. PM2.5 are fine particles less than 2.5 micrometers in diameter that can lodge in the lungs and get into the bloodstream. The World Health Organization says anything over 25 PM2.5 as a health hazard"

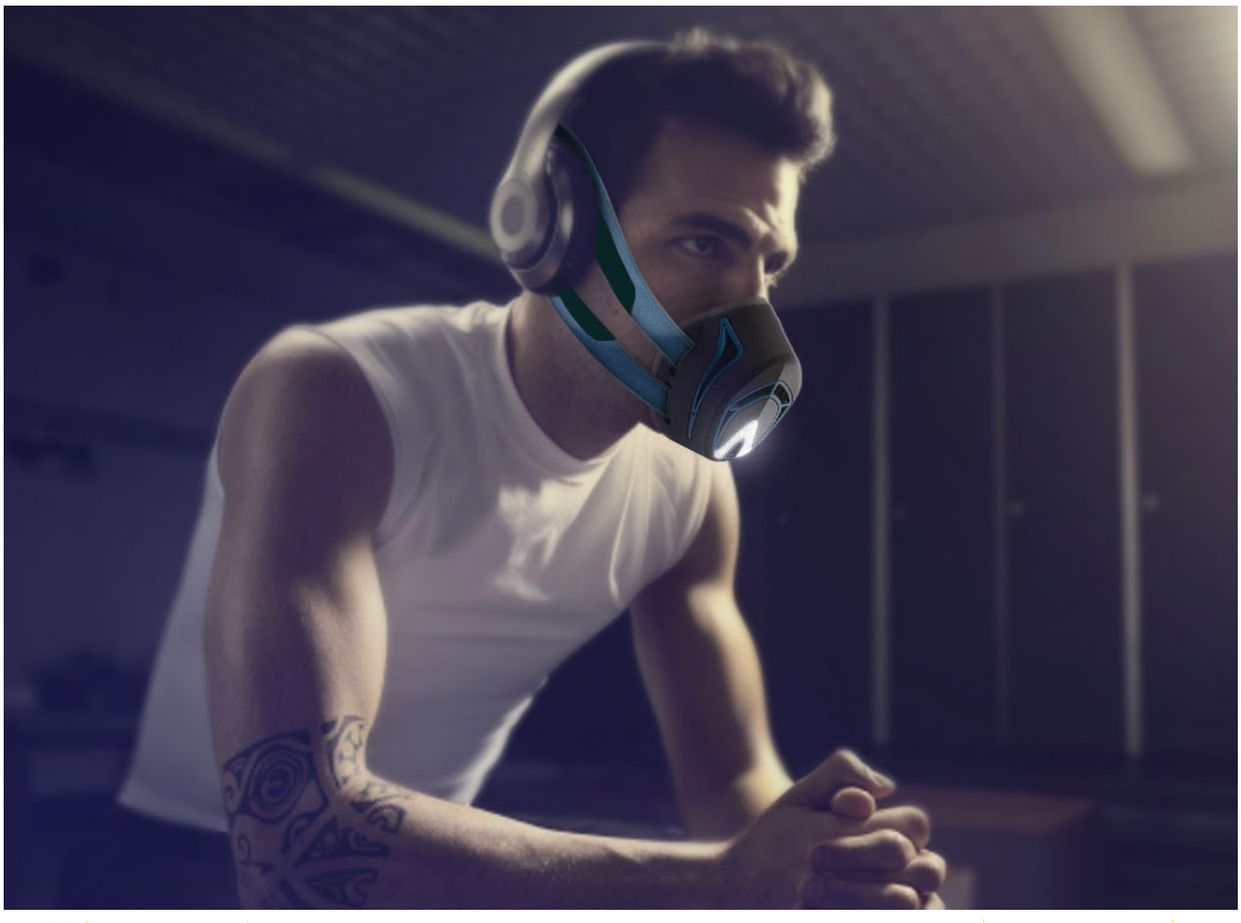
With rising air pollution levels, is it even healthy to exercise in these climates? Well... yes and no, over prolonged periods (25Minutes+) in polluted areas, it starts to get a bit detrimental to the users health. Studying the biology of how the human body reacts to the pollution, it was clear that problems existed.

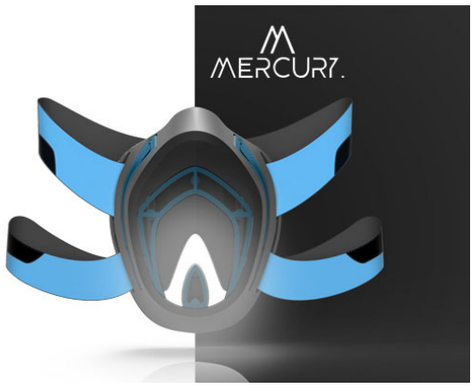
Health risks associated with air pollution can vary from short to long-term and increased exposure created adverse effects. This was caused by particulates in air pollution raising up the risk of lung cancer and cardiopulmonary mortality. Other effects include respiratory problems such as bronchitis and inflammation of the lungs.

*"The negative effects of exposure to pollution are well documented, and according to a recent **Running Times** article, athletes who train in cities have been found to have higher levels of lead in their blood.*

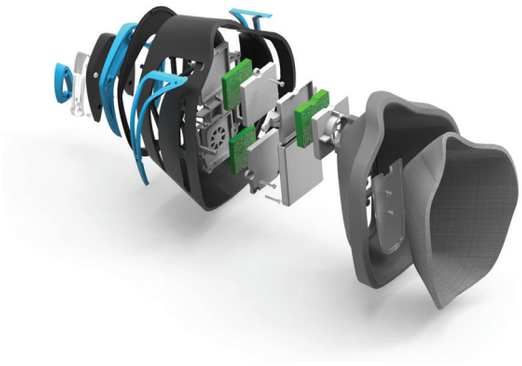
***Exposure to particulate matter** can lead to respiratory problems ranging from changes in lung function to premature mortality."*

Other research studies such as the Threshold Limit Values (TLV), states that the human body can be submitted to 8hrs of exposure to air pollution. However, in this day and age, the majority are now exposed over 24hrs.

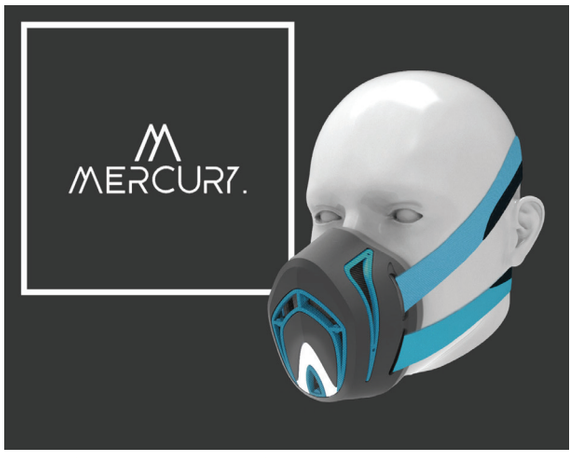




But enough of the gloom and doom, let's chat about the amazing product and how it came to be. Origin of innovation was formed by urban runners and commuting cyclists. When observing the users, they have minimal protection whilst potentially being the most at risk. Especially with running, the cardiovascular and respiratory system is more intense, meaning a more continuous flow of oxygen needs to be inhaled, leading to air pollution being taken in.



Existing products are out there on the market which can help protect these urban athletes but that's where the Mercury Mask breaks through the market. Mercury takes it past the point of just a protection aid by providing new technology to measure the pollution levels where the user is. This data is sent via Bluetooth to the app on IOS platforms. This lays a mapping of polluted areas and creates a sentinel environment with other users.



It enters what we call a "purple sea" effect. It's neither a blue lagoon in its original design and neither a red sea, full of existing products fighting for survival. The Mercury Mask enters the market which has a limited branded environment. It brings in new technology into a pre-existing field.

*Measuring of **V02 Max***

The measuring of V02 Max (Volume of oxygen - relates to physical fitness) is currently restricted to sports testing facilities for world class athletes. By bringing a simplified version down to a commercial

level, it opens the door to a whole new market potential. For the avid runners or the curious, it will aid the user to define a level of fitness that they can aspire to whilst remaining protected from air pollution.

*Dacc filter to prevent **Particulate Matter***

VO2 Max measuring is usually controlled through specialist equipment. It determines how well the oxygen is diffused through the blood which relates to the fitness of the user. By applying an oxygen sensor into the model and a series of one way valves, it can detect the oxygen content within the exhalation breath to give a rough guidance of the user's fitness and performance. Bringing this form of technology into a commercial environment opens the door to improving the fitness of non-athletes.

A Dacc filter is added to prevent PM (Particulate Matter) from being inhaled. With the filters in place, the mask was designed to reduce the breathing limitation to create an easy breathe product. The resulting vents are sized above the tracheas area coverage so that it wouldn't limit the inhalation.

***Mercury Mask** looks to help those in urban areas, to reduce pollution, raise awareness and increase fitness.*

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Bio Burn Stove

The unsafe burning of bio-fuels in developing countries for people who rely on bio-mass fuels to cook for their families and heat their homes daily is responsible for an average of 4.3 million premature deaths each year. These deaths are from illnesses attributable to household air pollution linked to the inefficient use of bio-fuels. Those who are so heavily reliant on bio-fuels on a day to day basis are more susceptible to and have an increased chance of suffering from many illnesses and diseases that kill more people than both Malaria and Aids combined. The percentage that die from each illness and disease are as follows:

12% due to pneumonia

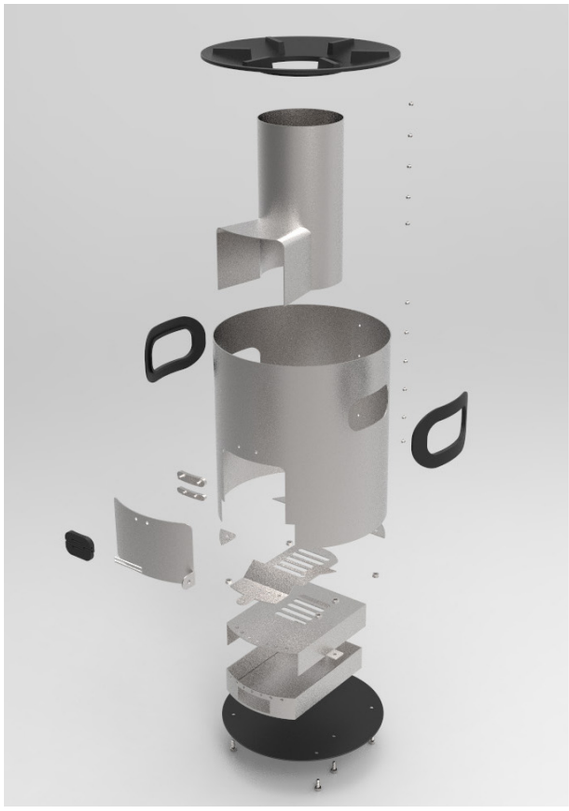
34% from stroke

26% from ischaemic heart disease

22% from chronic obstructive pulmonary disease (COPD)

6% from lung cancer.

UNICEFs 17 goals for Sustainable Development includes goal number 7 which is affordable and clean energy, the facts and figures released by UNICEF regarding the unsafe burning of bio- fuels and the impact it has on the user in developing countries shows the severity of the issue at hand and as time goes on and the population and demand for heat and energy in developing countries such as Guinea- Bissau, Mali, Rwanda which are countries most dependent upon burning solid fuels for energy. Despite current efforts and methods of prevention the unsafe use of solid fuels and gas is still a growing issue affecting millions of people each year if an innovative solution is not found. In 2015



the number of people relying on bio-fuels increased to over 2.6 billion and is expected to reach around 2.7 billion by 2030 due to population growth . This in turn will lead to an even further increase in the number of deaths associated to bio-fuels being burned unsafely as more and more local inhabitants will be using and burning bio-fuels in an unsafe and dangerous manner if an innovative solution is not found.

The Bio-Burn cook stove is a wood burning stove and proposed solution to the problems and issues caused by an ongoing and severe problem. The Bio-Burn cook stove designed to provide those in developing countries who rely on the burning of bio-fuels daily to cook and heat their homes with a cheap yet efficient product that will fulfil their daily needs and that will burn biofuels much more

efficiently and drastically reduce the impacts and dangers linked to the unsafe burning of bio-fuels whilst being easy manufacture, assemble, maintain

and most importantly, use.

Made primarily of sheet steel and assembled using cold forming processes for manufacture and assembly means the Bio-Burn stove maintains a relatively low cost in terms of materials and manufacture making it accessible and affordable to those in need whilst being efficient and innovative in terms of use and design . My design focuses on ease of assembly and disassembly so the users can easily disassemble it quick and easy maintenance and cleaning, then reassemble the stove with ease. This also means replacing parts when needed is easy to do by users in developing countries, this is a key factor as it means the users of the stove can clean and maintain the stove if any problems occur or any parts of the stove can be easily replaced if need be with little to no training or experience.

The vision for the Bio-Burn stove is to be the basis of an aid enterprise or even a collaboration with key initiatives. Ideally most of the parts required for assembly can be flat packed and shipped meaning more of the components can be sent at one time to save on shipping costs and transportation costs. The stove has been designed to with design for manufacture and design for assembly in mind.

As the proposed location of manufacture of the Bio-Burn stove is in developing countries and embedded into the business model of the aid enterprise to stimulate local enterprise and local economy in the local areas and as mentioned above cook stove has been designed in a way that local inhabitants can be taught by the instructions that come with the product which will explain the process of assembly and how to conduct the final assembly of my stove and pass that knowledge onto others creating a jobs in the area as well as teaching new transferable skills .

The plan is to create a form of infrastructure where the steel required to make the cook stove is sourced from countries/areas that have an excess of reusable sheet steel e.g. China. In turn this means cost is kept at a minimum and overall the Bio-Burn has a small carbon footprint as possible by using primarily recycled/ recyclable materials in its construction.

Bio-Burn - a basis for aid enterprise

- so aiding local enterprise

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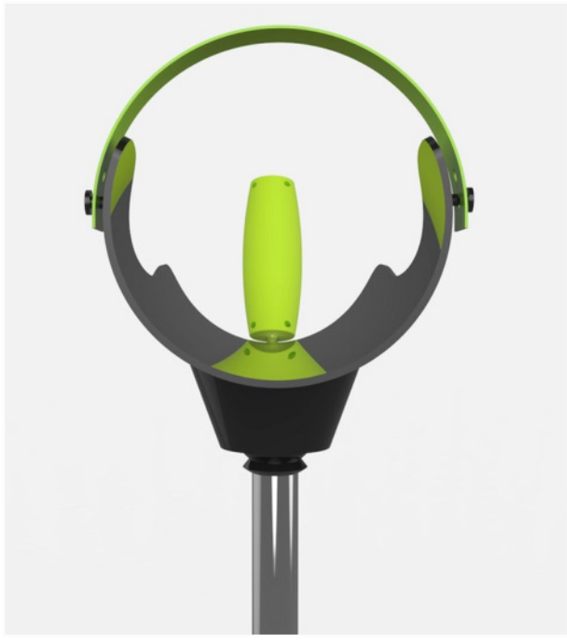
2AIDU

- assistive to walking aide

"It was one of the issues that was whispered rather than roared during the most recent general election campaign, with the number of older people (aged 85 and over) on course to double by 2030". (BBC News 2017). We know there is a huge challenge ahead as our population ages. Some theories suggest as a country we have a collective aversion to focusing on the realities of an aging society.

Currently products on the market are predominantly aimed at older patients in the advanced stages of life. Such products are often very simple and help the person mange these tasks, however there are a distinct lack of products available for people with mobility issues at far earlier stages of conditions who may look for a more modern product.



Innovation of 2AIDU

2AIDU is an adaptive and adjustable walking device that focuses on the user experience and the process of rehabilitation. The product provides the aesthetic most other products in the market lack, such as the coopers walking stick. The new product has all the

requirements of a standard crutch but has been rethought and can motivate the user during the recovery process. 2AIDU is designed to incorporate 3D printed parts which have a contemporary air and elegance.

The product is also adjustable with ergonomic and innovative features including a pressure distributing ferrule, a shock absorbing structure and a silicone strap for extra wrist support. These attributes offer a different interaction in comparison to existing walking aids. Unlike a normal ferrule that is solid and doesn't absorb shock, 2AIDU has a rubber pressurised foot that absorbs the tension when met with the ground. .

What holds designers back from whole heartedly leaping into this new field of design? There are still big obstacles such as deeply rooted stereotypes. Through meetings with a friend who suffers from Ehlers Danlos Syndrome and talking through the design with her this dialogue allowed me to see her issues with mobility and assistive products from the user end perspective. This allowed me to tailor the design around her needs to make it as useful, practical and comfortable as possible within the constraints of materials and a perceived budget.

Assistive protective equipment or medical products that are visibly worn or used in proximity to the human body can have a huge emotional impact on their users and bystanders. My approach is to make 2AIDU something the user is proud of; the colour variation was a choice to allow it to have a modern presence and not an outdated one. The shape of the product is the perfect balance of familiarity and innovation with its traditional curved body combined with the subtle illumination of the green handle. 2AIDU isn't going to be forgotten and it will be there to aid the user when it needs to be but importantly the used will be happy to be seen

with it.

Understanding the individual in need in an empathetic way and the social processes behind such experiences might assist designers and companies to design against and beyond stigma and relieve product users from the stress that comes along with stigmatized products. 2AIDU aims to help diminish the stigma of unattractive walking aids and be a familiar and positive tool in the user's life.

2AIDU endeavors to make users feel less frightened and ashamed of their walking aid by instilling within them a confidence in the product through design. This will help them with physical movement and mental wellbeing and the perception of their condition by themselves and others. It strives to be accessible and integrate itself into the everyday life of users who suffer from mobility problems.

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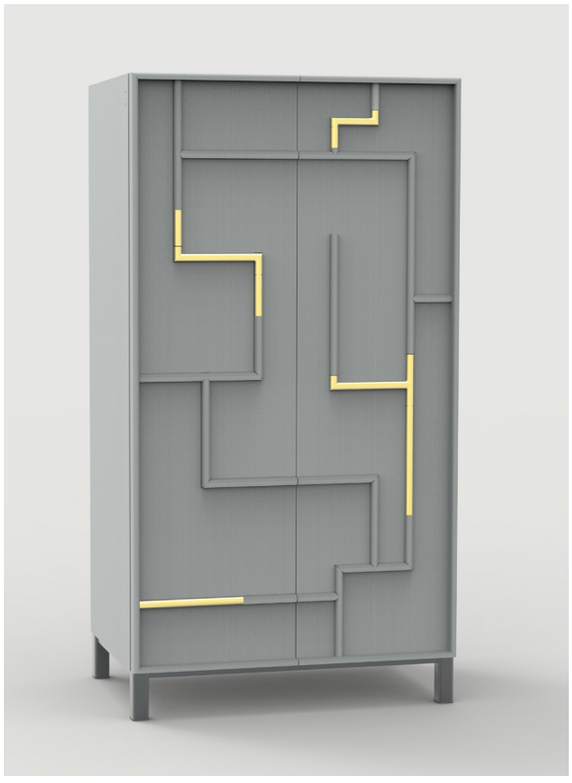
KONAH

- multi-functional wardrobe

The rising price of real estate is a big issue all over the world. Real estate prices are rising every year, with the number of population densely populated in large cities and the number of available homes are scarce. As a result, the space that individuals can occupy becomes increasingly narrow.

"The average housing area in the UK, including old and new buildings, is 85 square meters. On average, there were 5.2 rooms, with an average area of 16.3 square meters per room. In addition, the average new home in the UK is 76 square meters, with 4.8 rooms, with an average of 15.8



square meters per room. Thus, the house of England is becoming more smaller." (BBC NEWS, 2011)

"A citizen interviewed by BBC NEWS said they bought a house with three rooms, but the house should have been built in two rooms. The size of the largest room is 3.4m by 2.5m, which means that only a double bed is enough for a room, and closets and other products are only entering. And the rest of the rooms are very narrow and the kitchen is not enough to put a table for a comfortable meal."

(BBC NEWS, 2011)

"To maximize rental income, the country is proposing a minimum bedroom size in an effort to prevent landlords from renting their rooms at random. The house bedroom must be at least 6.5 sq m (70 sq ft). However, there is still a small room compared to the minimum room size standard." (The Guardian, 2015)

However, regardless of the size of the house, people own many things. which helped me come up with the idea of creating a closet that allows us to store the maximum amount of things in a minimum amount of space. In addition, I have made it possible with the understanding the users' lives and added various functions to meet their needs. For example, a hanger that can be opened and closed is installed on the door of a wardrobe to allow the user to hang things temporarily. In addition, on the inside of the door, additional storage was added to make many things easy to organize.

The pattern of the closet door has been designed in a modern way, while still taking inspiration from the Korean traditional house called a hanok. Thus, it was designed to seamlessly be part of the room with traditional furniture and modern furniture.

It is designed as a flat pack, it is easy to deliver, and the finished product is a free-standing wardrobe, making it easy to move.

A piece of furniture such as this is one of the everyday objects most closely related to people. Thus, it is important to understand their lifestyle. The furniture was designed to accommodate the users' needs throughout the day so that they can organise everything in one place and it becomes effortless to prepare for the next day making their lives easier and less stressful.

making furniture for the purpose and needs of small spaces

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CYC*LOCK*

'Encouraging the population to cycle'

Cycling is a popular activity that people use as a form of commuting, for leisure and health benefits. One of the main concerns when cycling is where people can leave their bikes, without components such as quick release mechanisms being stolen.

The Cyclock is a new addition to the market which enables consumers to leave their bikes in public places reassuring them that their bike is safe. The racks will be located in popular public areas giving a systemised approach to bike security rather than locking to any available location.

In the UK last year, there were more than

300,000 bike thefts, with particular hotspots being major cities such as London and Oxford. The aim of the Cyclock is to reduce this dramatically in public places by having all components secured to the bike when left unattended not just the frame, by doing this more people shall be encouraged to cycle on a regular basis.

'Investing in Innovation'

From initial research at the beginning of the viability project, there was a clear need for a complete locking solution so that people can secure their bikes in public places with 'peace of mind' that it will still be there when the owner returns. Security being the second highest voted concern by the users.

The Cyclock does this by having a locking mechanism which convincingly protects the quick release wheel mechanisms, and ensures that the components of a bike are considerably less likely to be stolen.

‘Considered Designing’

The main consideration in the early design was selecting suitable materials which would be appropriate for manufacture. The selected materials where steel and aluminium as appropriate surface finishes could be applied for a durable, strong finish whilst still being aesthetically striking.

All of the components are replaceable using anti-tamper screws so that the product can be a worthwhile investment for companies, knowing if the product becomes worn or damaged over time it can be repaired without needing to replace the entire unit. As the design developed the components were also reduced or combined to lower the cost to the consumer.

> ***Human-centered design*** *was a key development factor, basing the product around average anthropometric sizes and ergonomic shapes to make it* ***intuitive for all users****, and not hindering the user experience.*

‘Design Refinement’

The locking mechanism is a simple series of hole cut-outs based around average lock sizes, so that all different types of lock can be used on the product. The time for each rack in batch production will be approximately 4 hours.

The size of the full finished design is based around an average adult bike size, so the quick release components will be protected when suitably locked. However children’s bikes can also be locked into the design like a universal rack, making it suitable for all ages.

The other components such as the CNC tube bending have also been designed so it can be made in two separate parts and assembled. All of these design for manufacture components reduced the cost by approximately half from the first iteration, passing the saving onto the purchasing organisation. The process has a ‘streamlined’ design, so from the manufacture to the installation there is a minimal amount of processes to complete.

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KYROTECH

The project research began looking into injury within sport and later focuses upon rugby due to my experience within the sport and the issues surrounding injury and player safety that have risen to prominence in recent times.

Players are running further, hitting harder and more frequently than ever before and many clubs in the top flight experiencing and injury crisis'. There are on average 673 reported injuries per year in premiership rugby that result in a player missing the next game, this does not include players taken off during the game due to injury that return quickly.

There are 12 teams in the premiership. My study 'Investigation into the potential application of a wearable Technology or product to aid recovery from injuries sustained while playing rugby' highlights these issues as well as looking as current treatments used by players at various levels. During the study I met with a variety of players and physios including a trip to Leicester Tigers facilities to speak with members of their medical team as well as conducting a deep analysis of national rugby injury level reports produced by the RFU every year. The report focuses further on muscular injuries the treatments most commonly used which include;

Compression

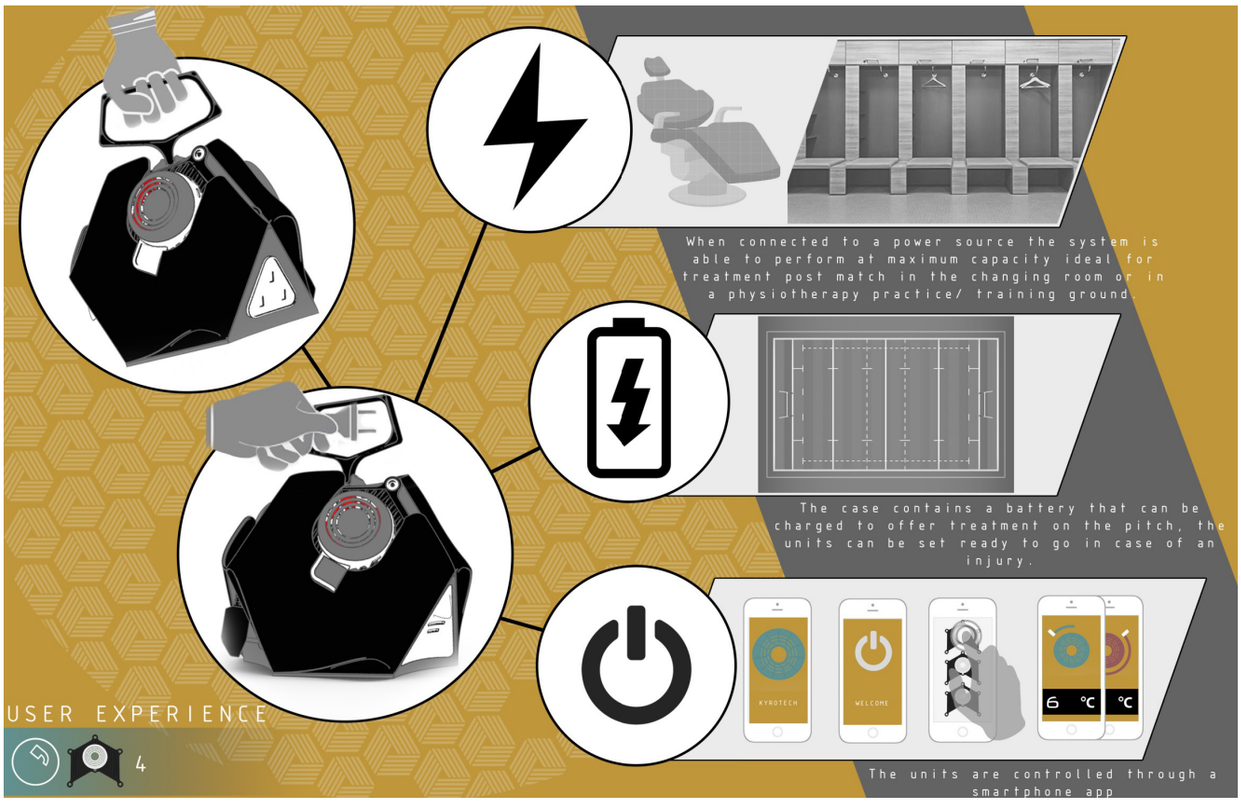
Heat therapy

Cyrotherapy

Electrotherapy

Cyrotherapy is the cooling of a targeted area of muscle and helps to reduce pain and swelling as helping muscular tissue to repair itself (temperatures can vary but are usually around 6-10'C). Products are already available on the market capable of performing the treatment and are able to achieve positive results.

However, these range in price from £3000-£16000 so they are not accessible to a wide range of clubs below the top flights. Furthermore, some require a constant supply of ice while others are extremely bulky so are easily transportable,



an issue, considering that half of all games are away and 70% of injuries are sustained during match time. Having highlighted potential market opportunity I moved into the first stages of development looking to design a system capable performing Cyrotherapy, achieving performance levels competitive with products on the market while offering a product that is easier to transport and setup at a significantly lower price making it more accessible to a wider range of players.

The obvious challenge in the early stages of the project was highlighting a component technology needed to create the drop in temperature required and a candidate was highlighted after a lot of research.

Peltier Cooling Modules have a variety of uses including the cooling of super computers in the absence of liquid, they work through a process called thermoelectric cooling where temperature is moved between two static planes. I began testing trying to cool water to the required temperatures using the modules, adding heat-sinks and better ventilation throughout the tests which were unsuccessful.

This led to the discovery of a thermally conductive silicone that could be used instead of the liquid when cooling and provides triple the thermal heating/ cooling efficiency. This was the breakthrough moment of the project and led to the development of the Kyrotech muscular recovery system which can perform both heat and Cryotherapy.

The design is driven by function, every aspect has been considered through careful analysis of user experience to deliver maximum usability and ease of transport to the user. Key features include:

The thermally conductive silicone that provides the cooled/ heated surface used to treat the user has an internal webbed structure allowing it to mould to the body and retain its shape.

The product is modular and multiple units can be combined to cover large areas of the body, the connection points also provide power to the units as they are combined.

The products casing contains a battery and cables needed to connect to mains power, this allows the units to be placed on standby before use and then taken onto the pitch to perform the treatment, and this has not been a possibility previously.

The bold design has been styled to sit alongside other sporting products competing to highlight their technical superiority.

-BSc Hons-DESIGN-PRODUCTS-
-GRADUATES-
-2018-

DMU:Design-Products Graduation Projects
Product, Furniture & Industrial Design *innovation*
De Montfort University

Erwan Le Bozec

Product Design BSc (Hons) 2018

French cultivated designer who is highly focused on the development of smart devices and their user interaction.

With a strong focus on conceptual illustration, CAD and electronics. Design practices covers a range of different projects done during 3 years at De Montfort Uni.

This work ranges from CAD modelling and renderings Sketches, and Digital Art and Product Design, both technical and aesthetic.

ZENO®

- smart meditation assist

- interactive with user's mood -

- non invasive medidative assist -

- monitors and optimises UX -

- 'app' feedbacks to user -

ZENO® a smart meditation device which aims at reconciling technology and personal calmness. With smart technologies increasingly becoming popular, a new type of non-invasive user interaction needs to be defined.

ZENO® is an example of how smart devices can interact with the user experience

Smart & calm

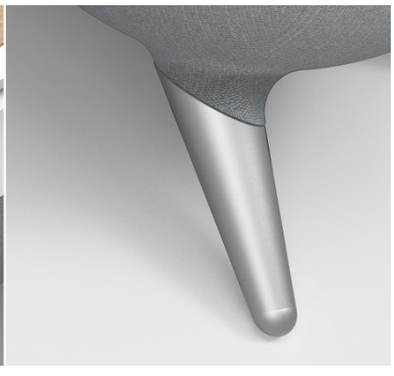
ZENO® Would introduce you to the benefits of meditation thought proven methods which includes, light, sound, aroma and deep breathing.

Care for you mind

Results are important for improvement. During each meditation session, ZENO® records your performance and upload it to your phone thought the app.

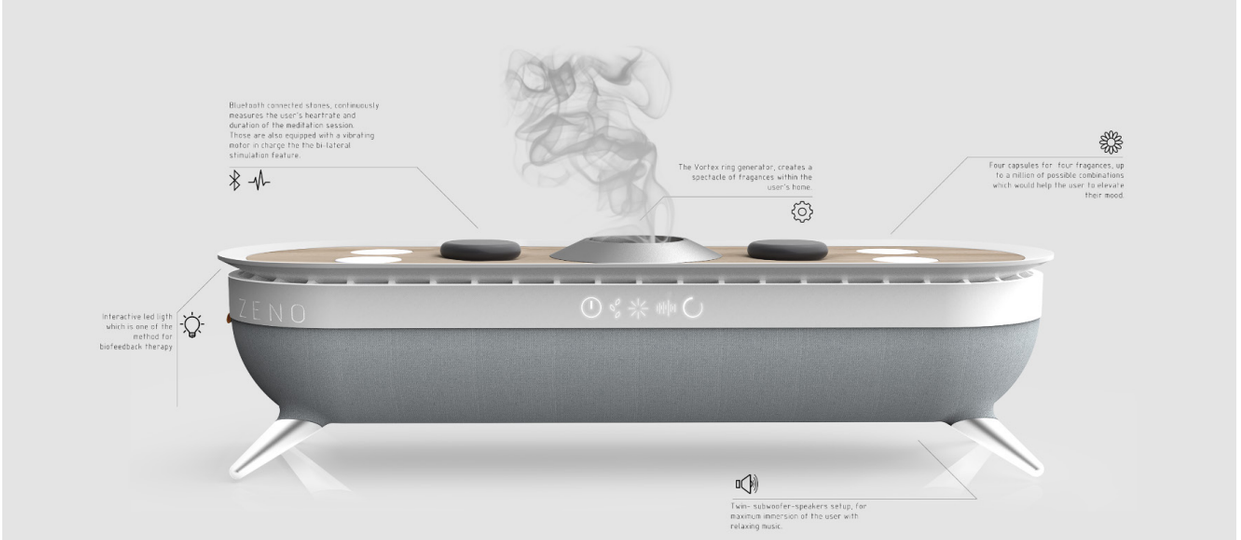
Wellbeing throught aroma

With four different fragrance oils, ZENO®, opens the door to a million of possible combination each with a specific aim such as increasing your immune system.

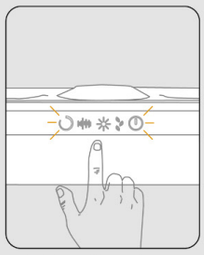


ZENO®

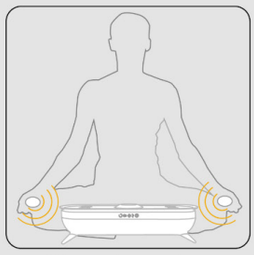
Where technology and calmness are reconciled



1. Pick up the stones



2. Choose the method you want to be assisted with.



3. Focus. The stone immediatly send data to the base unit

4. Open the app, and see how you have performed.

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Vertigrow

- modular hydroponic

Vertigrow is a modular hydroponic growing system which allows consumers to grow fruit and vegetables indoors whilst respecting the space constraints of small flats. Whilst living in London on placement in a small flat, it quickly became clear that the ability to grow fresh fruit and veg was almost impossible for many city dwellers in the same circumstances.

- adaptive growing modules -

Having recognised the disparity between the food we eat and its sourcing, the stackable design of Vertigrow allows the user to place plant growing modules around the house, especially at the dinner table.

The concept of bringing the plant to the plate is at the centre of Vertigrow, creating a novel solution

to reduction in food miles by offering fresh fruit and veg directly from the user's home and growable all year- round.

The product features a self designed pumping and water management system allowing simple, mess-free removal of modules from the main tower of the product.

To alert users unfamiliar with the growing process to the plant's needs, the product's grow light cycles as part of a reminder system.

- bring the plant to the plate -

- food miles reduction -

- fresh produce -

- food provenance -

- reduced food waste -

- daily de-stress -

Tahmid Ali

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Numa

Numa is a smart portable and multifunctional baby care product that can be used when travelling or at home.

Numa combines essential baby feeding items into a one compact system to enhance user experience.

portable and multifunctional

convenient for travelling

Travelling with a baby can often be a hassle as various essential items needed to be carried for the baby; this product aims to reduce the items needing to be carried when travelling.

The product is aimed at parents with new born children and children up to two years old.

- *UV pacifier sterilizer*
- *storage container*
- *baby feeding bowl.*

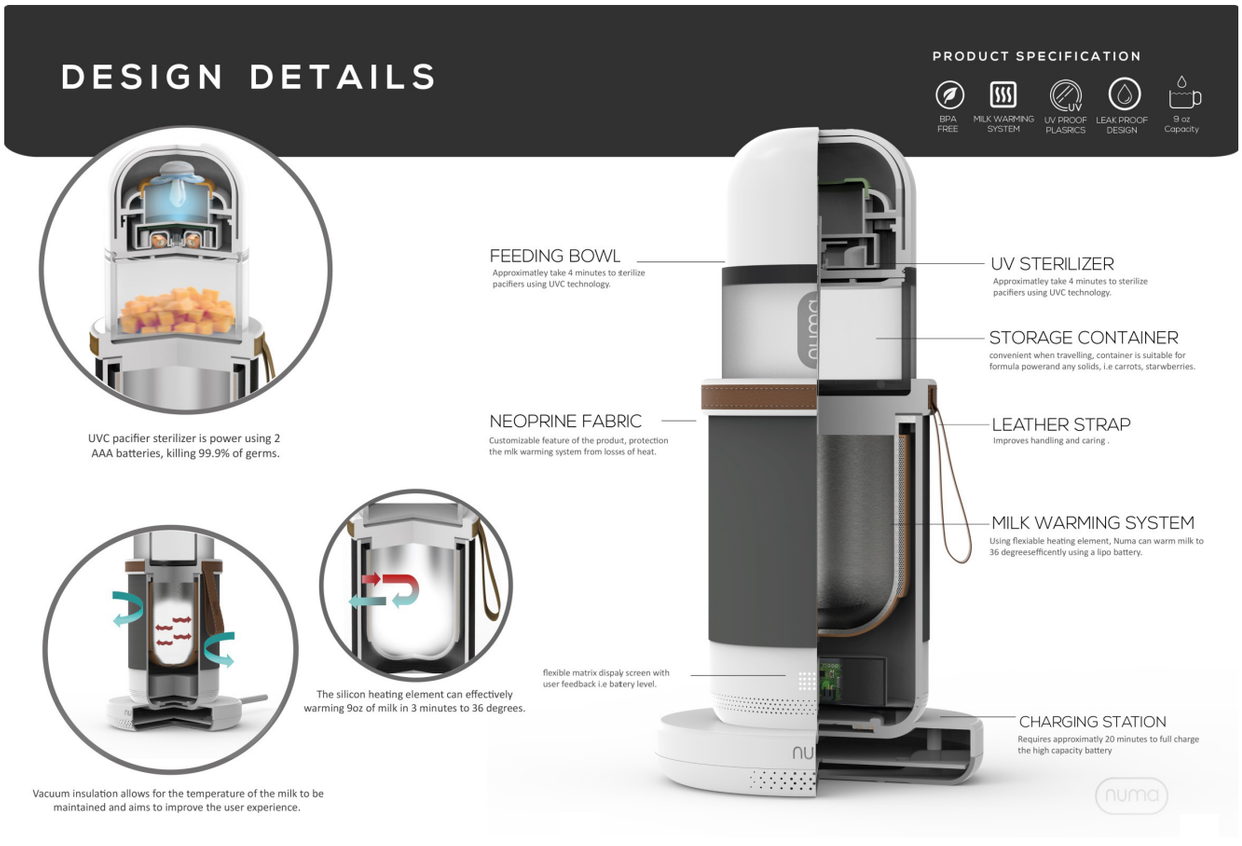
Numa is equipped with battery powered milk warming system, UV pacifier sterilizer, storage container and a baby feeding bowl.

Polymer PTC heating elements

The milk warming system uses Polymer PTC heating elements to warm milk to a safe temperature of below 40 degrees.

The UV sterilizing system uses UVC LEDs technology to sterilize pacifiers by killing 99.9% of bacteria's within minutes, this system has been tested in a microbiology lab with E.coli bacteria.

- sterilizes 'pacifiers', kills 99.9% of bacteria's in minutes -



Mohamed Said

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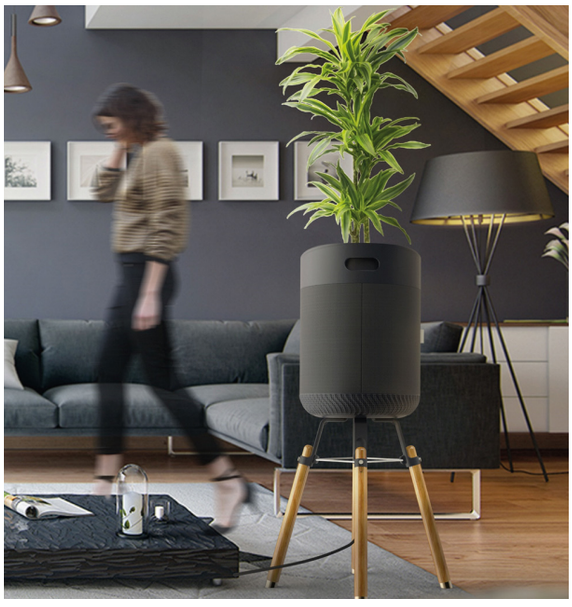
A young product designer who is heavily driven by the latest technology and design.

Utilising my skills in graphic design, illustrating and engineering, I aim to create a harmonic balance within my designs.

MOTION

- room air purifier

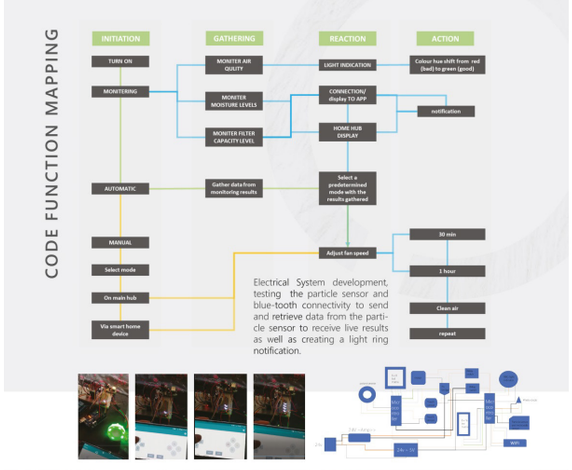


Motion function

MOTION® is smart air purification device designed to sync with your personality, providing full customization of the product to blend with your home décor.

- blend with home décor -

With smart home devices such as Google Home, MOTION® is designed to work with the built in PM1 particle sensor to alert and record the air quality in your home.



manual & WiFi controlled

It is able to be manually controlled over WiFi or set to autonomous which allows MOTION® to provide your home with more purified air.

- smart air purification device -

MOTION® incorporates both organic and artificial air purification methods to eliminate airborne viruses, bacteria, pollen spores, mould, and toxic gases in the air you breathe.

- organic and artificial air purification -

99% illimnation of airborne viruses, bacteria, pollen spores, mould, and toxic gases in the air you breathe.

- PM1 particle sensor -

The artificial Lily which is embedded with photo-catalysis material is specifically designed to clean the air.

- sync with your personality -

WIFI-app link monitors occupants wellbeing and modulates purifying process

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Riviro

- river cleaning system

Riviro is a waste collection device for rivers, aims to reduce the pollution found in waters of towns and cities.

Using cyclonic technology and harnessing the current of the river, pollution can be collected and removed from the environment reducing the damage of local wildlife and eco-systems.

- cyclonic technology -

"Plastic in rivers is a serious threat to wildlife"

River and Canal Trust, 2017

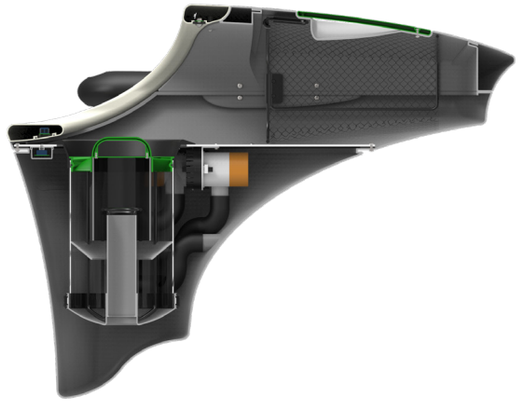
Why?

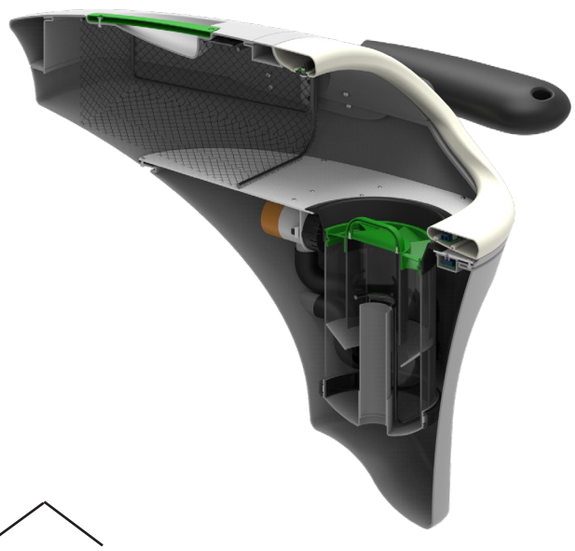
With the increased usage of plastic products, more of it is finding it's way into our rivers and harming wildlife.

Often long term affects result in loss of local eco-systems, loss of water life and a generally unpleasant river. But what if waste could be collected before causing any damage?

How?

The Riviro has been designed to draw in waste and small particles using the flow of the river. With a collection bay at the rear large particles are prevented from flowing further downstream.



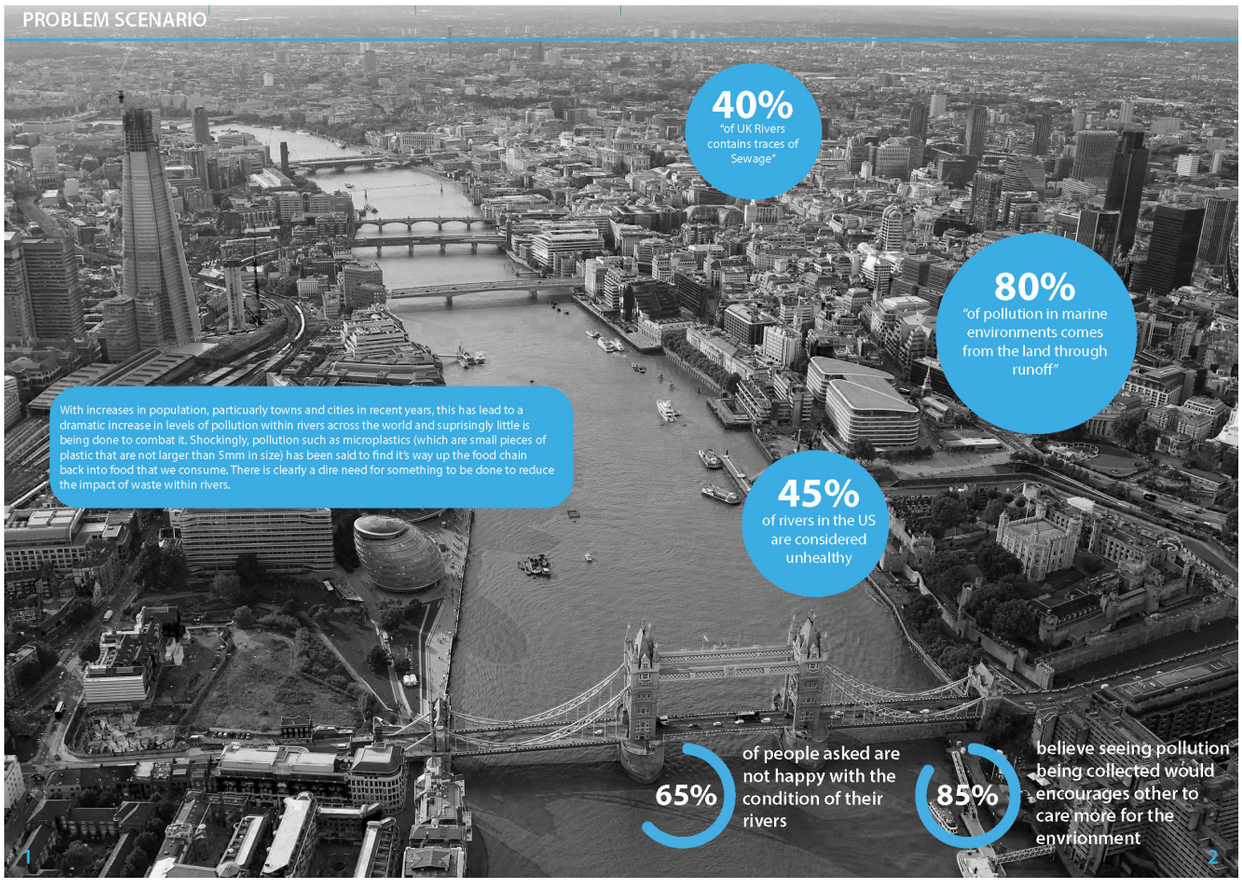


Below the surface is a hydro-cyclonic chamber, powered by four on-board pumps, that remove and collect smaller particles before the water is then sterilised by UV Light.

- UV sterilsation of waste -

- solar powered -

The system has been designed to operate on 12V so it could potentially be powered via Solar Panels.



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Aquaroute

- auto watering unit

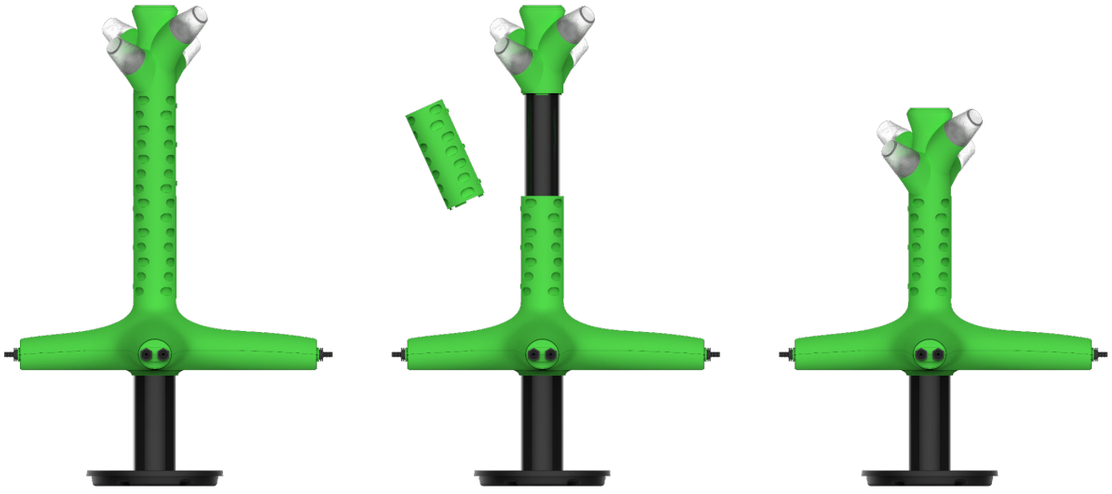
Aquaroute is a garden monitoring station which waters plants underground as well as providing up-to date information on the plants health. An increasing number of middle earners are gaining an interest in eating less of meat and more of vegetables.

Aquaroute has been designed to assist in tending to a vegetable patch in a moderately sized garden, by providing water directly to the roots of plants and monitoring soil moisture.

irrigation direct to root system

By irrigating directly to the root, Aquaroute uses significantly less water than drip irrigation or sprinkler systems. The design has scope for up to eight watering pipes. It also holds rain fall monitoring and soil moisture measurement capabilities.

- 8 radial feed points -



- automatic irrigation -

LED grow lights can also be attached to extending arms from the side to expedite the growth of the vegetables.

Information about the plant's health is broadcast back to the home Wi-Fi, where it is sent to the cloud for remote access from anywhere.

- wifi monitoring -

This means it is easy to monitor the health of plants away from home.

The product's carbon footprint is reset to zero within an estimated 3 growing seasons. The system is designed to have a reliable working life of 15+years. The product life cycle delivers a 93% recyclable metric. Each irrigation module can deliver irrigation to a 3.5 x 3.5 metre growing area.

Potential future markets will focus on commercial growing applications in the EU and Asiatic sectors.


POUR
PRO-POD
WHEY PROTEIN
WHEY PROTEIN ISOLATE
25g
BANANA
PROTEIN
25g

PRO-POD

-DESIGN-PRODUCTS-
-GRADUATES-
-2017-

DMU:Design-Products Graduation Projects
Product, Furniture & Industrial Design *innovation*
De Montfort University

Monique Spoerri
Product and Furniture Design
BA Hons
Graduation 2017

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A dedicated young designer, with a strong interest in the relationship between products and their environment.

STRUO:

- living & liveable workplace

STRUO Design Process

A survey about working from home was carried out, targeting professionals with varying genders, ages, places of residence and professions. Development sketches and design aesthetics were presented to them as well for user feedback in the final concept.

- iterative prototyping -

- user-engaged throughout -

- sustainable metrics -

STRUO Aesthetic

A functional, simplicity is embedded in the warmth of a pure form familiar, which exudes a contemporary timeless quality.

-clean minimal form -

- elegantly ease of use -

- quiet and sure functionality -

STRUO Concept

Today's technology allows people to work from home. A series of surveys showed that about half of young professionals have the flexibility to work at least one day at home.

The STRUO desk not only provides a suitable work area and effectively organises belongings, but also hides these belongings from sight.

- home based working -

- comapct and ordered -

- technolology managing -

STRUO Interior

STRUO is comprised of four modular units: vertical and horizontal shelving, drawers and modular cubes.

The modular cubes organise the various work necessities such as files, small notebooks, writing implements, etc. A cube also provides a suitable grip for wire management.

STRUO Materials

The main material used is grey Valchromat, a sustainable material that is coloured throughout, requiring no edging.

The interior is clad in Linoleum, providing a surface that is warm to the touch and a comfortable writing surface.

The Ash legs harmonize with the Valchromat.

- solid colour Valchromat -

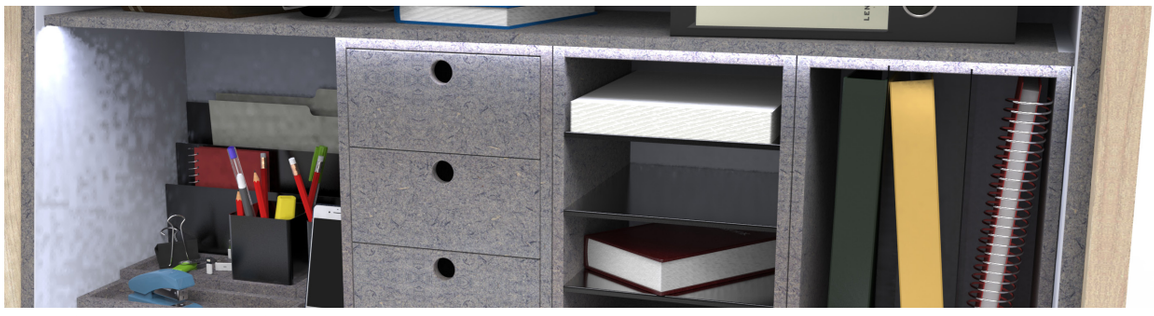
- warm touch linoleum -

- ash framework -

Designed to age with character and patina.

STURO us a life long possession which narrates the life and work of the user by the aging process.

sustainable work-life



Jack Fletcher

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An enthusiastic and driven Design Engineer with a strong aptitude for Computer-Aided Design, problem-solving methods and a desire to produce innovative solutions.

‘Click-Bit’

- mobile modular tool system

New “Click Bit”

The Click Bit is a hand-held cordless power tool aimed to consolidate common production/ construction tooling into a simple and easy to use handset.

The Click Bit uses a unique mechanical attachment to engage and disengage all varieties of tool bits at rapid speeds without the need to change tools.

Easy To Use

The Click Bit attachment uses a quick-release mechanical technology that allows the user to switch between tool bits with a single clicking action.

This allows the user to select from a kit of tool-bits ranging from socket heads, to driver bits, to key bits without having to change tools or adjust a chuck. It can be done with one hand!

- product assets & attribute -

- safe & ease of use -

- unique quick release system -

- quick & easy tool switch -

- cordless & fast charge -

- range of tool components -

- time saving &sure function -

- cordless mobile & compact -

Cost Effective

The Click Bit saves the user from having to buy a full range of different power tools. This enables the user to load up the tool bits required for a job and simply interchange them as they move through their assembly workNo more piles of power tools or missing equipment.

Quick and reliable choce and function. Intuitive product interaction coupled with mobility and compactness.

Glenn Byford

Product Design BA Hons
Graduation 2017

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www.GlennByford.com

A prolific graduate designer with an invested interest in User Centred Design, perceived quality and emerging technology

Placement Year in industry 2015/16

LAETA

- Well-being for all

Through first hand research it is clear that there is still stigma attached to men participating in activities like mindfulness and meditation.

The Laeta well-being system tackles many of the current problems with products on the market at present, and also brings a new twist to personalised stress management.

'Across the world, men die an average six years younger than women for reasons that are largely preventable'

Intuitive interaction and augmented intelligence of the product functions deliver a seamless user experience

We can all take action to live healthier, happier and longer lives'.

- movemeber.com

Laeta presents a nurture for lifestyle change as a proactive form preventative healthcare / well-being

ARBON: *commuter*
- cycle helmet

The Arbon Commuter helmet provides an easy-to-use solution to protecting the user from harmful air pollution.

Poor air quality is a major contributor to numerous respiratory conditions.

Integrated Filter Mask

The product effectively integrates the filter mask into the helmet to tackle the main issues faced with existing products.

Reduction of Moisture Build

The powered ventilation contributes to the managment moisture build-up and reduces the steps required to use the product and lengthens the period which the product can be used.

Active Exhaust

Active Exhaust promotes a positive exhale and esnure that the cycliset is provided with coppius supply of cleaned-air.

By powering the exhaust, Co2 and moisture are removed. This keeps the mask dry and hygienic for the user.

Compact Battery Pack

The battery pack is housed safely in the helmet to keep the mask lightweight.

User-Product Interaction

Enables and promotes reliable use of the filter mask and enhances the protective attributes of the Arbn product

Katrina Bacon

Product Design BSc Hons

Graduation 2017

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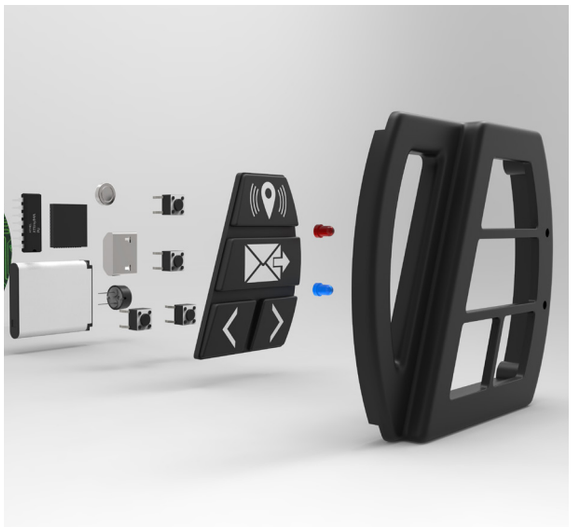
Proactive product designer, always pushing to perfect the finer details of a design.

work placement- Jaguar Land Rover.

ELIXIR

- integrated smart care



Elixir Smart Case

Elixir Smart Case aids people with asthma and anaphylaxis.

The cases cater for the medical devices-such as EpiPen's and Inhalers, and is connected to a wearable device via Bluetooth.

Elixir Smart Case notifies the user if the medication has been left behind, aids finding the medication in an emergency and monitors the temperature of the medication.

This assists the user to focus on living and being relaxed in social contexts at any time, whilst being assured of ELIXIR's supportive function.

- re-focus on living and being -

Target Market

During market research, many survey respondents expressed concerns about younger people being embarrassed of having to carry around their medication.

Elixir Smart Cases' design decisions centre around appealing to the younger generation.

Available in different colour variations, there's an Elixir Smart Case for everyone.

Ths rebrand the perception of medication to one which is lifestyle centred and and life-affirmative.

Find-My-Medication

Product focuses on key medication regimes

1. If the user enters anaphylactic shock or asthma attack the 'Find my Medication' button is pressed.
2. The medication case sounds an alarm and its LED lights flash for ease of locating.
3. The medication case lid is opened with the aid of a spring and the medical device is retrieved.
4. Medication is administered and monitored

Fob Technology

An exploded view of the fob shows the electronic components it contains.

The fob contains a SIM card reader to send a text message to a selected person which informs them the medication has had to be used.

The fob can be worn either on the wrist like a watch or around the neck on a lanyard.

Various styles of colour, material finish and materials can be applied to the visable fob and the medication case. Additive manaufacturing offers the potential for discrete customisation.

William Dredge

Product & Furniture Design BA Hons
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A keen product and furniture designer with an interest in innovative natural materials.

work placement- Contract Candles LTD

FORGE-SOFA-SYSTEM

- sofa-living for the needs of family and home

The Forge Sofa System

The system can be adapted to different positions and spaces.

This can be completed by adding or removing alternative parts to create the wide range of seating options to fit the users' requirements

This systems is equally suited to loft-living through t studio apartments

The Forge Adaptability

- responds to everyday living on an everyday basis

- grows and and compacts as family life evolves

- offers customisation on choice of materials & finishes

Moving furniture around or into the home can generate a variety of issues due to the size of the products, such as having to remove windows to install the furniture or the difficulties of transporting the item.

The Forge Sofa System is designed to break down in order to resolve these issues.

Mechanisms

The Forge Sofa System has an adjustable backrest that can be set to two different angles.

This aids the user when working or enables them to make the seat more comfortable when relaxing.

Components can be easily removed when the user wishes to complete a task on any of the products in the range, such as replacing the upholstered arm cover for a solid workspace.

The individual units are notably lighter and easier to maneouvre as compared to typical lounge furniture

Materials

The Forge Sofa System uses a range of materials with a variety of manufacturing methods.

A large majority of the components are made from laminated timber which is then faced with a layer of melamine.

Other components are upholstered or formed from steel using a variety of methods.

Sustainability is conisdered throughout the system, using a range of green-materials to ensure the systems' foot-print is gentle on the environment

Emily Hancock

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Graduation 2017

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A unique designer with a passion for improving the lives of others.

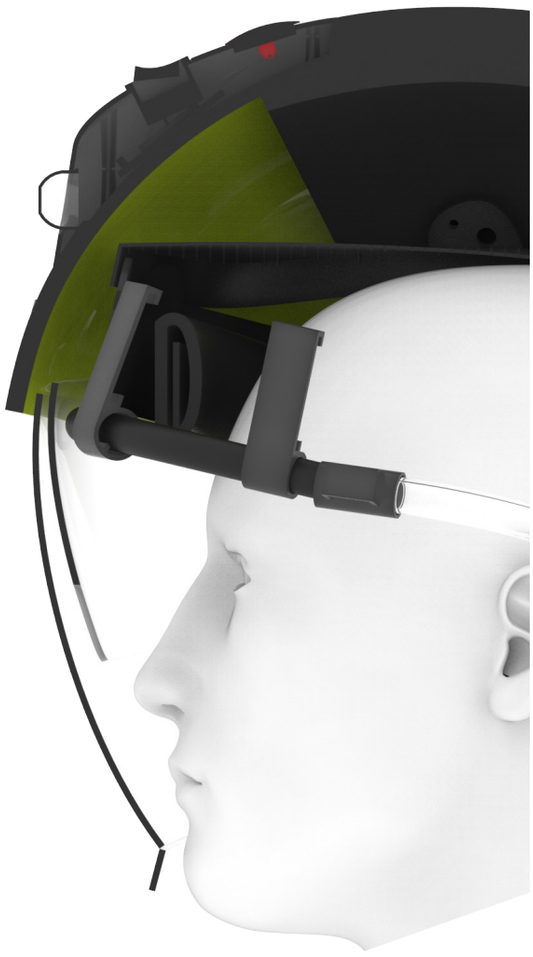
Successfully completed a year-long industrial placement.

Rosenbauer Product Inventory

The Rosenbauer Product Inventory is a range of three products looking at improving the comfort of fire-fighters both in the present and future.

This NPD stratgey also aims to while secure Rosenbauer's hold their market-lead in the Fire Personal Protective Equipment (PPE) market.

This product inventory collaborates between the designer, manufacturer, and user to ensure all involved parties benefit.



2017: HEROS-relief

HEROS-relief is an immediate improvement retro fitted to the Heros-xtreme and HEROS-titan to stop the visors from misting up and to help keep the firefighter cool when attending a road traffic collision (RTC).

This is achieved by using the HEROS-relief motor to increase airflow through the helmet, into the vent attached to the internals of the helmet and then down the visor.

2020: HEROS-titan V2

HEROS-titan V2 will extend the HEROS-titans market share by adding increased functionality and features to the helmet for minimal cost to the manufacturer.

The HEROS-titan V2 includes improvements in weight reduction and an SOS feature so if firefighter is in specific trouble the watch manager is able to track their location and assist as required.

2025: HEROS-colossus

The HEROS-colossus also includes the upgrades from the HEROS-titan and the addition of a torch and thermal imaging unit, with a Heads-Up-Display in the mask to allow the firefighter to recognise hot spots.

The HEROS-colossus will be the first helmet and mask integration within the Fire PPE industry allowing all firefighters to have their own breathing apparatus mask.

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An ambitious and dedicated designer who is motivated by intuitive detail and clean aesthetics.

Jake is good at communicating ideas as well as taking advantage of emerging technologies.

Dementia Support

- aiding and supporting

The Design

During the design process, through meetings with Dementia groups run by Alzheimer's Society, much of the Home Support System has been designed by the people with Dementia themselves.

The Hub has been designed with a balance of familiarity and innovation so it will not be forgotten. The Home Support System is there when you need it.

- Dementia Support System -

This product is a Home Support System to aid a person in Early Stage Dementia.

The system relieves some of the issues that come with the condition, in particular, short-term memory loss. The system looks to enhance friend and family relationships by perpetuating the users' aspirations, identity and lifestyle.

Inspired by the Amazon Echo – a voice-activated home hub which can play music and give news or other information – Jake began working out a design for a device which could act as a memory aid for people with forms of dementia, symptoms of which include memory loss and difficulties with thinking, problem-solving or language.

The smart unit could help people find which room their keys are in, give them information about what time and day it is and about the weather.

It can also ensure their oven is used safely, communicating with a sensor on the oven trip an alarm when cooking time is up and informing a family member or friend if the oven is left on for long periods of time.

The design uses an artificial intelligence housed inside a vase-like pod, activated by a simple button. The uses of the button can be pre-programmed keeping things simple for the user. The unit features a screen which can display useful information.

Jake said: "I chose yellow and black for the screen text as a result of advice given to me at the dementia meetings – these are the clearest colours for people with the condition because of the high contrast.

"The design has changed and improved so much from these discussions. They've been essential – that kind of feedback is so helpful and it's not easy to find but it's right here at DMU."

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PRO-POD

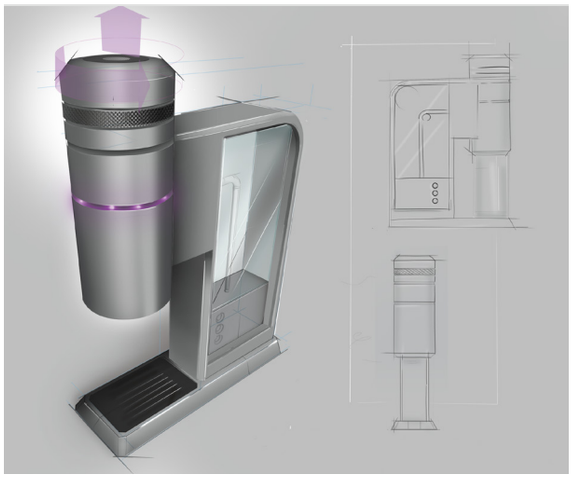
- Protein Machine

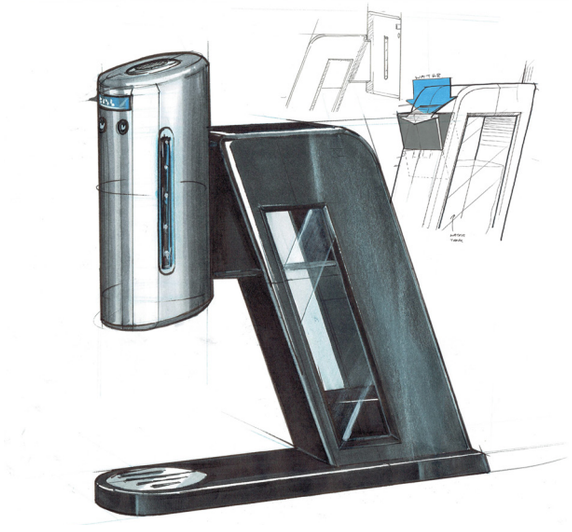
The PRO-POD is the Nespresso of Protein Shakes; a luxury appliance that delivers single serving supplement shakes from Pods.

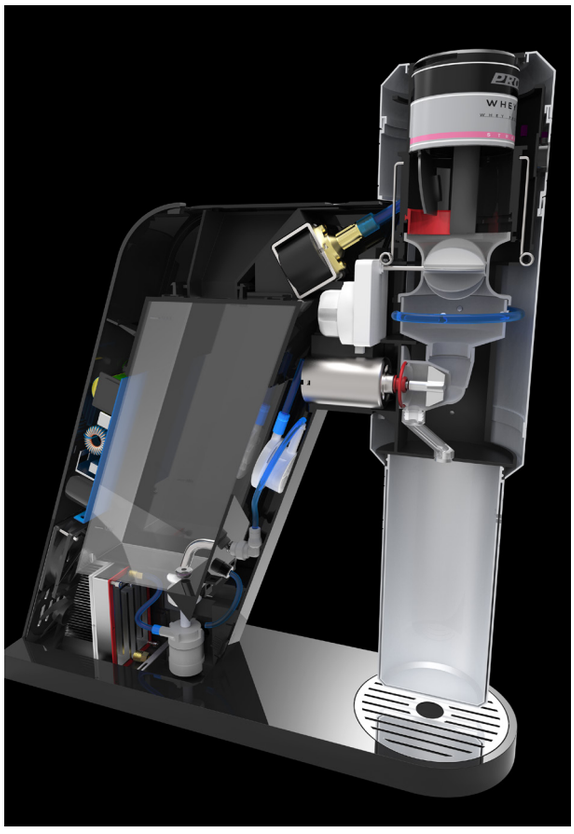
In addition to the mess-free convenience of pods, the PRO-POD utilises captured fitness data in-conjunction with an accompanying App to provide the user with personalised supplement recommendations.

Sketch Development

Low and High fidelity sketches aided in the development of the Industrial Design of the Pro-Pod. Loose, iterative sketches were used to explore form while more refined sketch renders were created for presentational purposes.







Functionality

The PRO-POD provides chilled water through a recirculating cooling system consisting of 100W peltiers, water block, heat sink and axial fans.

Powder metering is achieved through a rotating valve while a vibration pump delivers cooled water before the two are mixed with the aid of a 10,000RPM DC motor. UV-C LEDs are utilised as part of a self-cleaning function.

- delivers chilled water -
- metered powder portions -
- vibration pump mixer -

WiFi Connectivity

Wi-Fi connectivity allows the user to remotely control the PRO-POD via an accompanying App and deliver features such as location settings and scheduled dispense times.

These features ensure the user receives a cool, freshly mixed drink exactly when they require. It also ensures the optimum protein supplement is consistently maintained.

- WIFI link to personal log -
- protein shakes measured to suite -
- otimised protein supplement -

Alex Nurse
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A highly-motivated, enthusiastic designer interested in User-Centred Design and the emotional impact that products generate in everyday life.

ANAJECT

- ease of medication

Anaject is a compact adrenaline auto injector. It is designed with the user in mind to remove the stigma of carrying a medical device.

Anaject endeavours to help anaphylaxis sufferers feel less frightened about the prospect of adrenaline auto injectors and gain a familiarity with this lifesaving device.

- removing medication stigma -

- carry & medication refill cases -

- intuitive ease of use -

Anaphylaxis is a severe allergic reaction to an otherwise harmless substance.

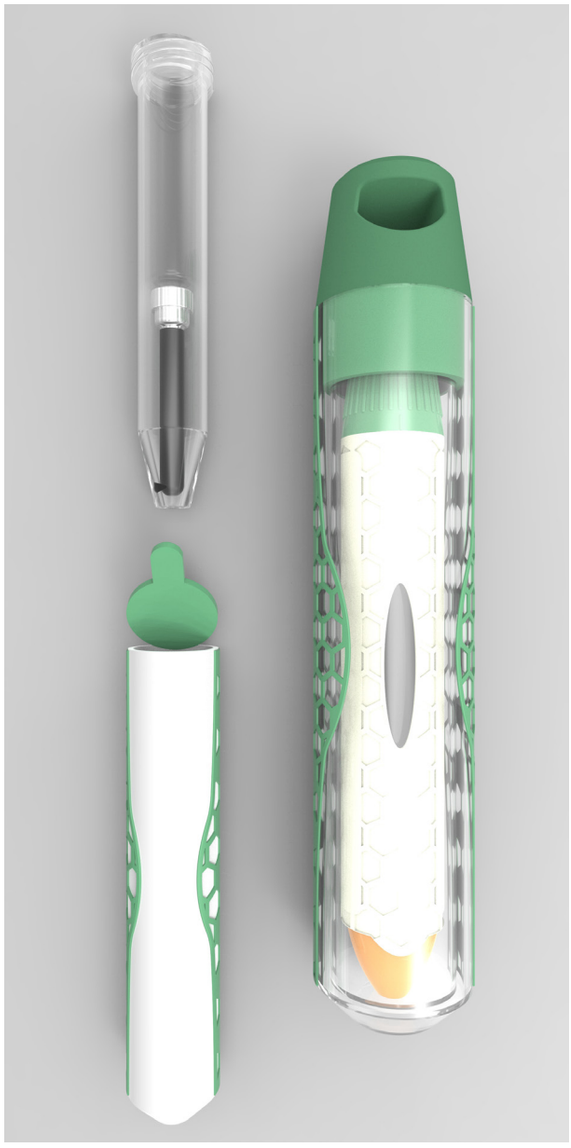
It is required to carry 2 adrenaline auto injectors at all times.

Anaject allows the user to carry only 1 auto injector and the medication refill case, eliminating the need to carry 2 bulky auto injectors.

- 90 second application time -

- monitors medication need -

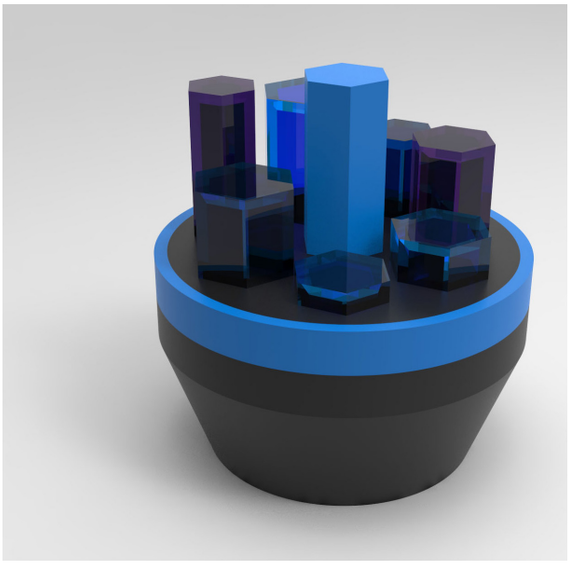
- triggers signal for dosage -



- customisable epi-pen cases -

- e-printed at the local surgery -

- 100% recyclable components -



Visual Money Bank

The Visual Money Bank is a money management system that helps users to visualise the money they are spending in relation to their weekly budget previously set.

Any money left over from the weekly budget is automatically transferred into a savings account. This enables users to take control of their spending through a daily visual cue.

As only 8% of the world's money is physical, to help with the transition to becoming financially independent, the Visual Money Bank provides a physicality to their bank account in contrast to the digital form of money today.

developing assertive management of personal expenditure

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'The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it ' - Mark Weiser

RYZER

- indoor cycle training

Indoor cycling is a fundamental part of a cyclists training programme. Ryzer enables the cyclist to undertake such training with ease and convenience.

Indoor Cycling Training

Indoor cycling is a fundamental part of a cyclists training programme.

Simulation software such as Zwift has been created to allow cyclists to cycle with each other whilst still being at home using a smart turbo trainer.

Flat surface cycling allows overall strength and fitness to be gained although under-develops some muscle groups, compared to road cycling that develops all muscle groups together.

The RYZER is developed to help combat this. Fitting under the front wheel of a bike, it connects to the cycling software.

When an increased gradient is met on the software, the turbo trainer increases the resistance as usual, and the RYZER raises the height of the front wheel.

This means that the effect of a gradient is realistically simulated, and more rounded muscle development is promoted.

- positive resistance training -

- promotes incline training -

- achieves rounded fitness -

RYZER In Use

Once mounted under the front wheel the angle can either be automatically controlled by the software, or by the handlebar mount.

As the training session is finished, the height can be set to the lowest setting and thene then the product is easily stored.

- no fixtures-to-bike required -

- incline can be adjusted dynamically -

- folds away to compact size -

Mechanical Design

The principle of the design uses a scissor lift, however the sections have been angled inwards to improve stability and strength.

The rails the runners slide in have also been bent to cause the lift to tilt backwards as the lift rises. This keeps the front wheel firmly in place as it moves backwards around the rear axle pivot point.

- reliable scissor mechanism -

- five stage ease-for-assembly -

- systemised for ease maintenance -

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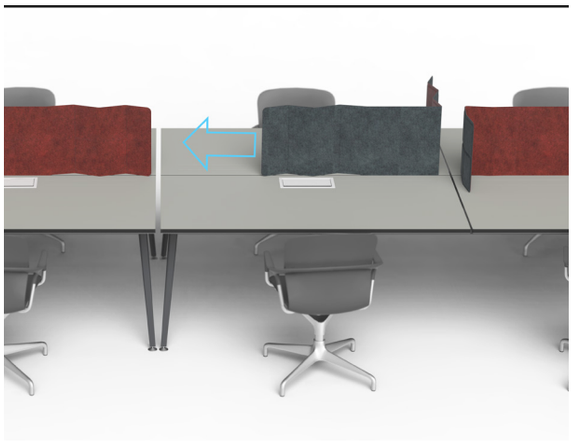
"I want to live in a world created by art, not just decorated with it."
-Banksy

ADAPT

- adatable workscape space



Individual + Collaboration

The contemporary workspace needs to be able to create conditions for effective team working and has to be adaptable to meet the needs of individuals and teams.

Good interaction spaces should offer the appropriate level of privacy which will depend on the content of the interaction and the personalities involved.

The Adaptable Workspace

The workstation furniture can be customised by the use of simple folding screens which offer varying degrees of visual and acoustic privacy.

Includes a structured system for accessory management, organising the use of stationery, file storage and notes.

The system includes free-standing fabric covered acoustic screens which can be easily moved to form screening or more private enclosed meeting spaces.

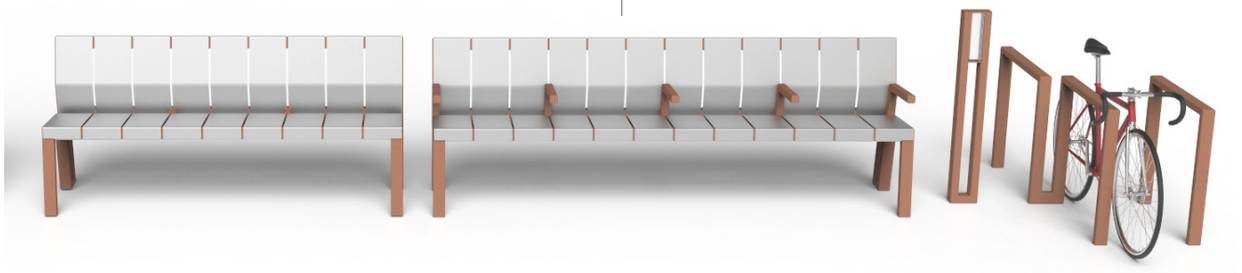
Marshalls Street Furniture

Creating a co-ordinated range of contemporary street furniture in collaboration with hard landscaping specialist Marshalls PLC.

- modular system -

- range of street elements -

- corrosion resistant + durable -



Complete Range

Designing a range of street furniture for a transport environment. Combining folded sheet metal with box section to create a simplistic industrial theme.

With the option of a four- or three-seater version, with and without armrests. Completing the collection with cycle stands, bollards, planters and bins.

- client based specification -

- flexible & adaptable features -

Team Projects

Team projects are an integral feature of the creative industries.

The following 5 reasons summarize the importance of teamwork and why it matters to your career potential

1: Teamwork motivates unity in the workplace

A teamwork environment promotes an atmosphere that fosters friendship and loyalty. These close-knit relationships motivate employees in parallel and align them to work harder, cooperate and be supportive of one another.

Individuals possess diverse talents, weaknesses, communication skills, strengths, and habits. Therefore, when a teamwork environment is not encouraged this can pose many challenges towards achieving the overall goals and objectives. This creates an environment where employees become focused on promoting their own achievements and competing against their fellow colleagues. Ultimately, this can lead to an unhealthy and inefficient working environment.

When teamwork is working the whole team would be motivated and working toward the same goal in harmony.

2: Teamwork offers differing perspectives and feedback

Good teamwork structures provide your organization with a diversity of thought, creativity, perspectives, opportunities, and problem-solving approaches. A proper team environment allows individuals to brainstorm collectively, which in turn increases their success to problem solve and arrive at solutions more efficiently and effectively.

Effective teams also allow the initiative to innovate, in turn creating a competitive edge to accomplish goals and objectives. Sharing differing opinions and experiences strengthens accountability and can help make effective decisions faster, than when done alone.

Team effort increases output by having quick feedback and multiple sets of skills come into play to support your work. You can do the stages of designing, planning, and implementation much more efficiently when a team is functioning well.

3: Teamwork provides improved efficiency and productivity

When incorporating teamwork strategies, you become more efficient and productive. This is because it allows the workload to be shared, reducing the pressure on individuals, and ensure tasks are completed within a set time frame. It also allows goals to be more attainable, enhances the optimization of performance, improves job satisfaction and increases work pace.

Ultimately, when a group of individuals works together, compared to one person working alone, they promote a more efficient work output and are able to complete tasks faster due to many minds intertwined on the same goals and objectives of the business.

4:Teamwork provides great learning opportunities

Working in a team enables us to learn from one another's mistakes. You are able to avoid future errors, gain insight from differing perspectives, and learn new concepts from more experienced colleagues.

In addition, individuals can expand their skill sets, discover fresh ideas from newer colleagues and therefore ascertain more effective approaches and solutions towards the tasks at hand. This active engagement generates the future articulation, encouragement and innovative capacity to problem solve and generate ideas more effectively and efficiently.

5: Teamwork promotes workplace synergy

Mutual support shared goals, cooperation and encouragement provide workplace synergy. With this, team members are able to feel a greater sense of accomplishment, are collectively responsible for outcomes achieved and feed individuals with the incentive to perform at higher levels.

When team members are aware of their own responsibilities and roles, as well as the significance of their output being relied upon by the rest of their team, team members will be driven to share the same vision, values, and goals. The result creates a workplace environment based on fellowship, trust, support, respect, and cooperation.

Without the ability to effectively work in a team environment, you could delay the success of developing, formulating and implementing new and innovative ideas.

The ability to problem solve is reduced, as well as the attainment of meeting goals and objectives, in turn, limiting the efficiency and effectiveness of growing a successful company is hindered.

Flogo

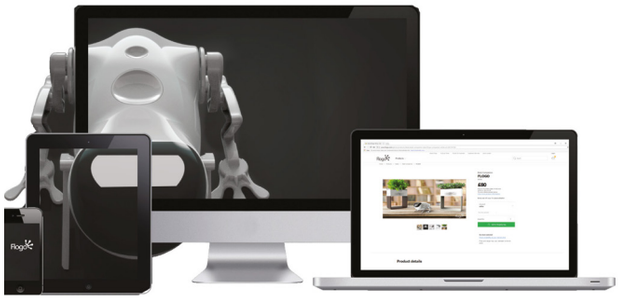
- kindly helping you to hydrate in hop...

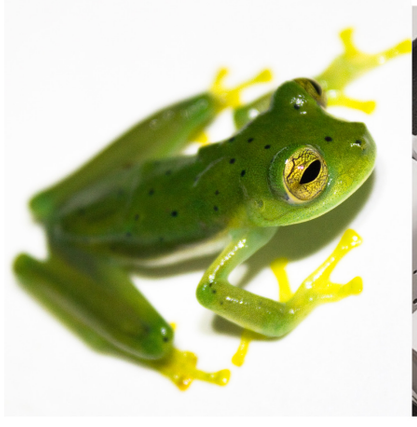
Flogo ® the frog is a smart desk pet which would gladly remind you to hydrate yourself and will lighten you mood during the day at your office.

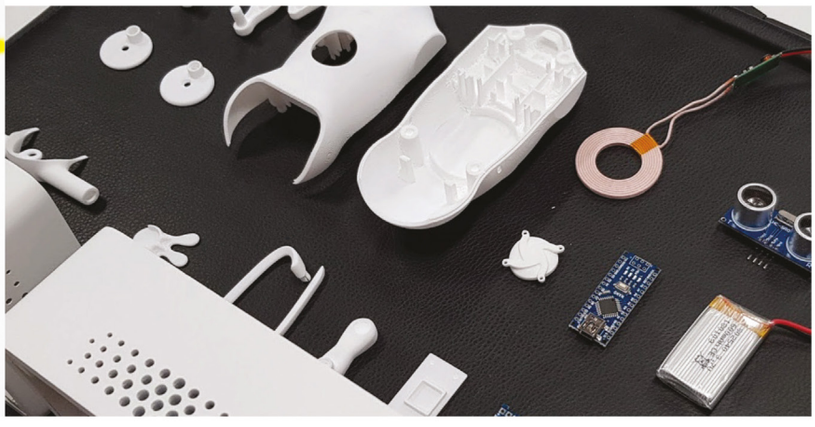
Flogo ® has been developed with a team of undergraduate designers where each member was highly dedicated to perfecting the final prototype.

Prototype PCB has been developed with surface mounting technology.

Like many smart devices, Flogo ® is equipped with technologies which measure air humidity, temperature and web based forecasts.







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