

# PIXELATED REALMS: NAVIGATING A LOW-ENERGY FUTURE

THE CRAFT OF CREATIVE PROPOSAL UNIT  
By Lucca Muchmore

## Abstract :

This is a proposal about the creation of a prototype Self Checkout from a near future scenario using the approach of design fiction to explore this speculative project.

Within this document I highlight the area of focus and the context around key case studies, speculative design, design fiction and it's approaches.

Using a range of methods, I will employ and have an overview of considered ethics for the participants I work with. I include a time line for the project that facilitates the structure of my project and also that seeks to mitigate any foreseeable issues.

# My Topic

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## Topic, Objective/Aims and Deliverables

### My Topic & Objective:

I have chosen to explore speculative design through the Lens of design fiction. Using a Scenario of a low energy future my ambition is to use to create a self checkout for use within the next 10 years. My design fiction object will be refined through multiple research techniques, resulting in an interactive prototype. I would like to make a physical object for humans to interact with.

### Project Aims:



Raising awareness of the carbon footprint and energy used by technology.



Creating a user experience through a human interaction with an object.



Evaluate how people react with low energy technology and raise awareness of hidden energy use.

### Outcome:

Create a design fiction prototype of a future self checkout based on a low energy scenario.

# Why?

## Choosing my topic:

My project focusses on energy demands and as such has the potential to benefit society. I have chosen to complete a speculative project that addresses environmental concern around energy demands and carbon footprint by the use of every day machines.

### Why energy?

- Energies rising demands
- Technology using and being increasingly more wasteful with energy E.g. unused cloud storage.
- More reliance on renewable energy
- Relevance recently e.g. Russian Ukraine war

#### Russia sanctions: What impact have they had on its oil and gas exports?

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War in Ukraine



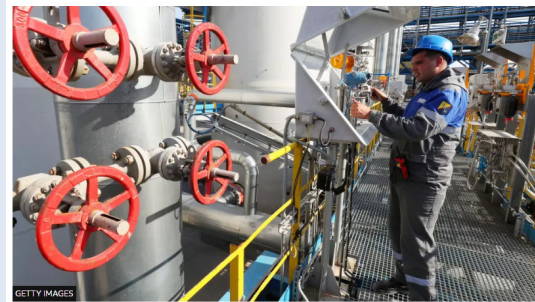
By Jake Horton & Daniele Palumbo  
BBC Reality Check

Russia sanctions: What impact have they had on its oil and gas exports?  
By Jake Horton & Daniele Palumbo (FIG 19)

#### Nord Stream 1: How Russia is cutting gas supplies to Europe

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War in Ukraine

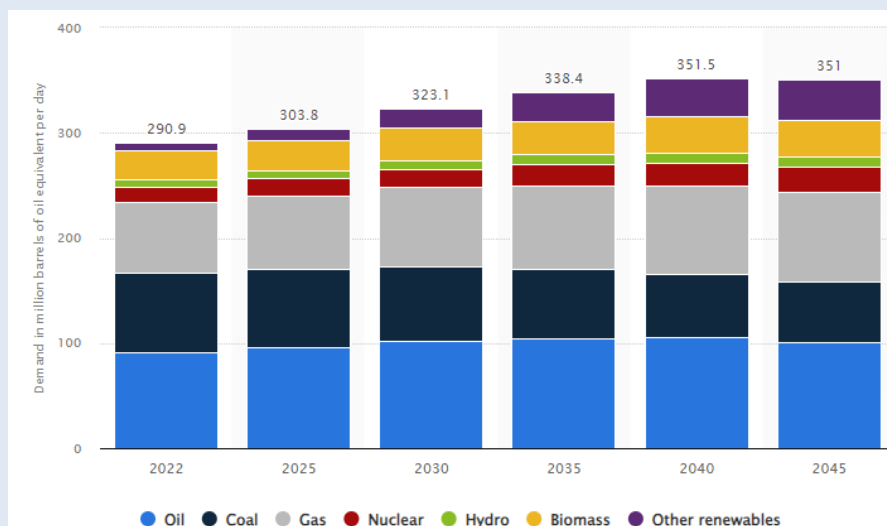


Nord Stream 1, Russia's largest gas pipeline to Europe, has been closed indefinitely after a number of leaks were found in it and a parallel pipeline, Nord Stream 2.

Nord Stream 1: How Russia is cutting gas supplies to Europe by The BBC FIG 20)

With energy production and its ever increasing demand we see a shift from fossil fuels to a demand for more renewable and sustainable energy sources as seen in the graph below.

Through this project I aim to explore the concept of reducing energy usage to mitigate this increase in energy demand. I want to explore this concept through the route of speculative design to create a thought provoking project.



Primary energy demand worldwide in 2022, with a forecast until 2045, by fuel type by Madhumitha Jaganmohan (FIG 21)

# Why?

## Exploring energy through Speculative design:

Speculative design and designing for/about the futures have always captured my interest, especially futures created by people for a human experience which is rooted in a real need to solve a problem. I am choosing to work speculatively with a design fiction approach as I feel it allows me to explore an avenue of design that is new to me.

Exploring environmental issues and carbon footprint through the lens speculative scenario is important to me as a designer and person, I want to explore the idea of future crippling energy demand and the result of a potential low energy future. I also want to look at how the User Experience will change and adapt to this speculative scenario.

My prototype will ultimately be physical and realised through multiple forms of research to understand how the user experience will change and adapt to a low energy self checkout machine. The choice for a Self checkout comes from the fact I have worked in a supermarket for approx. 5 years and have seen the evolution of the checkout experience with these machines becoming more prevalent in supermarkets. I am interested to see how these machines might change in the near future and based on a low energy concern.



Self checkout (FIG 1)



Self checkout 2 (FIG 2)



Self checkout 3 (FIG 3)

## Personal Motivations:



I will delve into an area that hasn't been overly explored. A speculative scenario where low energy interfaces become the norm as a result of energy demands not being met. Asking the question of how can we make the most of increasing demands on power and ecological concerns in order to make an efficient low energy experience.



I want to create a physical, interactive prototype which has an interesting narrative. I am inspired by Artists such as Naim June Paik and his ability to see into future interests using objects and human interactions.



Future design and using concepts from popular culture really interests me. I was inspired when I read 'Make It So' by Nathan Shedroff and Christopher Noessel by their analysis of lessons we can take from sc-fi movies. I wonder what could be done if we dare to imagine it.

# Research Scope

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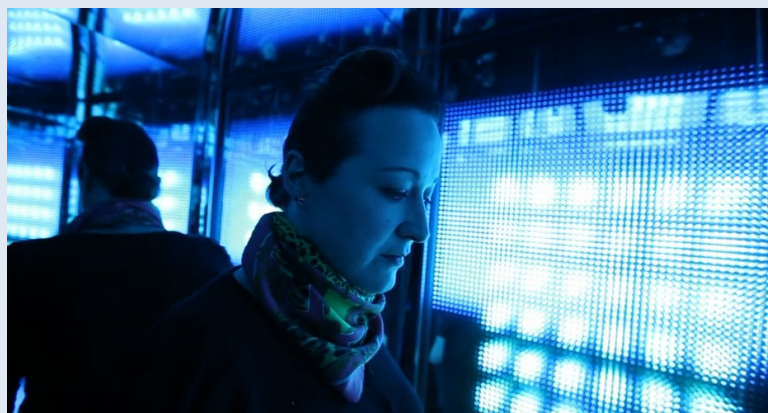
## Research Questions and Project Scope

### Scope:

The scope of my project will be focusing on low energy everyday interfaces of the future. We use machines every day such as cash points and self checkout kiosks. These objects have a high energy cost to them in order to maintain the convenience to users. I would like to look at the UX of how these new interfaces will affect a user, as well as asking how people will interact and navigate them, ultimately find out what potential there is for a low energy interface. By applying design fiction approaches and research conducted, I want to create a tangible Interface which could have every day use in an every day scenario within the next decade.

## Research Questions

1. How will energy use and current demand affect user interfaces in the future?
2. What design principles should be considered when developing low-energy interfaces for different types of electronic devices?
3. What role does user feedback play in the iterative design process of low-energy interfaces and how does it contribute to enhancing the overall UX?



This is a design fiction object; The Photon Shower is a light therapy booth designed as a concept product for Delta airlines to remove/reduce jetlag for flight attendants. Designed by Sitraka (FIG 4)



## Exploring Speculative Design

In this section I will be presenting the concept of speculative design, including a brief overview on key and relevant approaches to speculative design.

### Speculative Design:

Speculative design is designing for the future. It is considered a means of exploring Future Design through experiences and objects.

Conducting speculative design can lead to a wide range of futures being described as possible with utopian or dystopian scenarios, Plausible and probable being more grounded in reality. These futures can be seen in the illustration from Anthony Dunne and Fiona Ruby highlighting the spectrum of what is possible in speculative design.

Exploring future scenarios through speculative design can be done with many different approaches, some which are seen below:

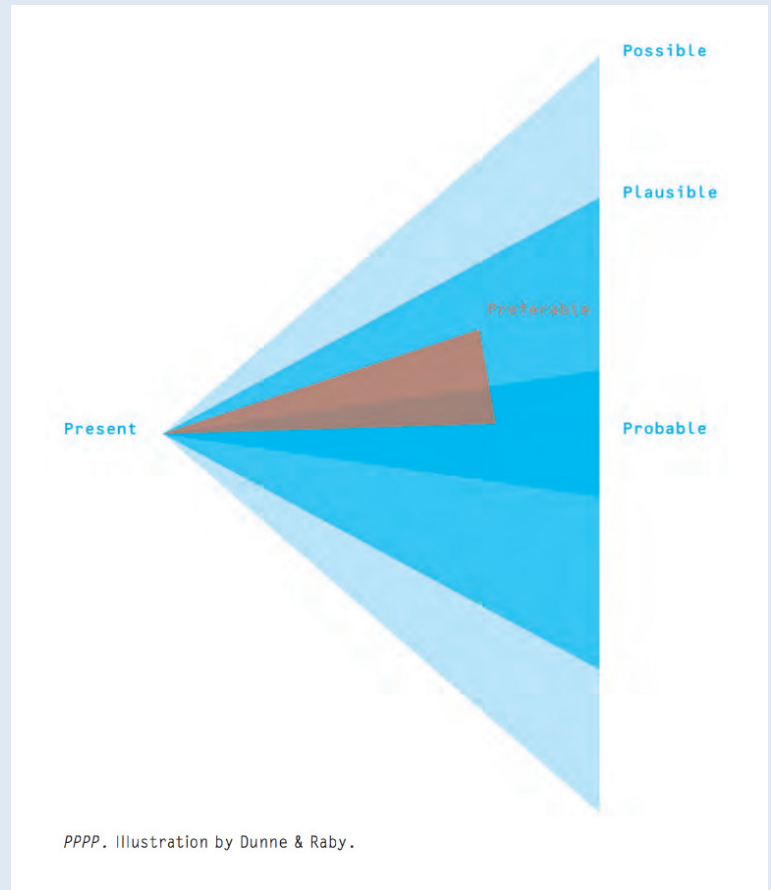
- **Critical design**
  - Utopian/ Dystopian design
- **Design Fiction**
  - Post-human design

Of these four speculative approaches I find critical design and design fiction to be the most interesting:

Critical design is a particularly interesting approach, it focuses on provoking ideas about the present using ideas about the future to question social and ethical norms. Ideas highlighted by Anthony Dunne and Fiona Ruby in their book 'Speculative Everything', discuss the importance of using techniques such as critical design as it is thought provoking and experimental in it's approach in order to ultimately question the processes and function and aesthetic of a product.

A good example of critical design can be found in 'The Toaster Project' by Thomas Thwaites and also the 'The Huggable Atomic Mushroom'. The process of the design of both these objects show us how to create unconventional thoughts about an a object and uses this to realise alternative ideas about the object within the design.

I believe design fiction is the most appropriate approach to speculative design for my proposal. The design fiction approach is to create a tangible and evocative prototype from a near future based on a speculative scenario.



PPPP by antony dunne and Fiona rigby (FIG 5)



Priscilla Huggable Atomic Mushroom, The Toasted Project by Thomas Thwaites from Antony Dunne and Fiona Ruby (FIG 6)

## Design Fiction

This section analyses design fiction its history and the overall concept and ideas around the approach to speculative design.

## Design Fiction:

Design fiction and its approach to speculative design was created in 2005 by Julian Bleecker, an engineer and a designer who created 'The Near Future Laboratory' in partnership with Bruce Sterling who is a Sci-fi author and futurist. Design Fiction was born from the idea of Design and Science Fiction and is the idea of speculative scenarios or worlds told through physical objects.

Design fiction is similar to the process used by an archaeologist; discovering an object, analysing the object and using this analysis to create a narrative on how people interacted with the object. Which in turn provide insights into what society was like that required, designed and used the object.

I find the approach of design fiction and speculative design particularly interesting and relevant. The key idea is to examine what things could look like in the near future instead of allowing speculation into decades or even hundreds of years into the future which can also avoid the high end spectrum of utopian and dystopian design. Design fiction allows people to question near futures and speculate with familiar every day objects.



Julian Bleecker and his company the near future laboratory is a designer to look at that focuses on design fiction objects such as:

- Food
- Magazines
- Household objects
- Maps.

Motional and Autonomous Vehicle Futures - Julian Bleecker/the near future laboratory (FIG 8)

Design fiction itself has many aspects and approaches used by different designers. Each designer will approach design fiction with a different intention and reasons for exploration. For example Julian Bleecker and Near Future Laboratory describe design fiction as not to focus on the movie star but focus on the object in the background, and what and why the object is the way it is. Other designers like Phillip Jordan talks about using design fiction as a form of prototyping to create for the future before it becomes a possible reality.

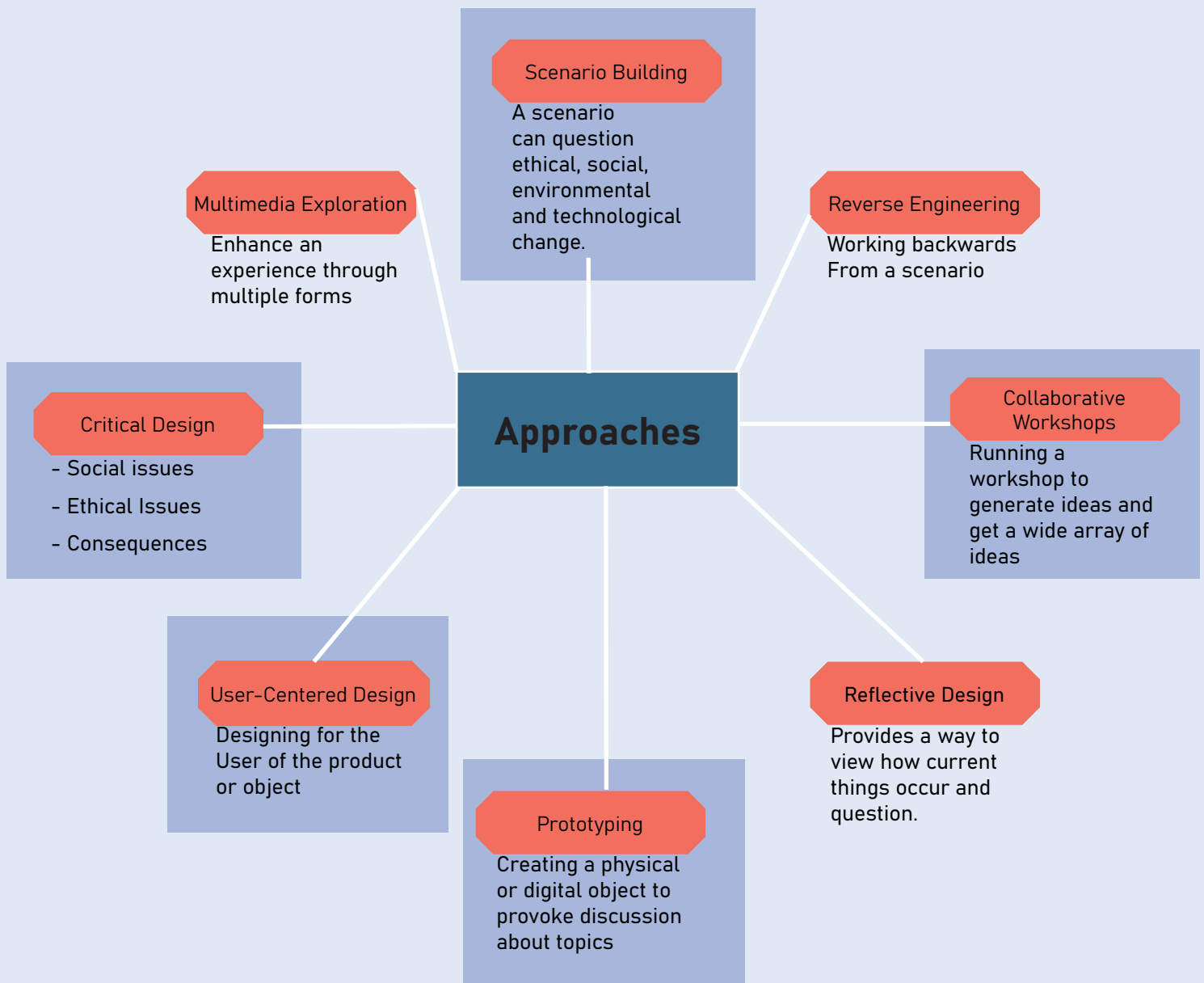



## Design Fiction

This section analyses design fiction and key figures in the field and their approach to creating design fiction objects.

### Approaches to Design Fiction:

Design Fiction has been approached differently by different designers. Decisions about how to go about creating an object from the future often varies. The following approaches can be mixed and matched.



 = Approaches to Design fiction that I will explore in my research to create my object

## Key Case Studies and Designers

There are many interesting case studies from contemporary designers and groups that relate to my proposal and what I would like to achieve with this project



The Photographers Gallery small file photo festival online exhibition (FIG9 )

The Photographers gallery hosted a competition and exhibition to capture/create the smallest file size photo possible. This embraces a low energy concern.



Oquonie is a text less isometric puzzle game. Created by 100 rabbits (FIG10 )

100 Rabbits or 100.r are a group who work and conduct their ideas and operations from a boat, with the goal of research and testing low tech solutions to creating games and e-books.

This is a real example of what is possible, 100.r create complex things in low tech and shows what can be done with limited tech



Julian Bleecker / The Near Future Laboratory- A Box of Cereal from a Future (FIG11)

This is Design fiction object created by Julian Bleecker and the Near Future Laboratory of a cricket based cereal. This is a simple every day object which speculates about the future (are we eating cricket cereal for nutrients? is it because of a lack of grain?).

This is a great example of a Design Fiction object which looks like an everyday object you might find in the supermarket.



Currency converter, 99 cent futures by the exploration factory (FIG12 )

This is a project by The exploration factory. They created in collaboration with people these objects based around products sold for 99 cents. These were then displayed in a Bodega they hired out.

I like the approach to generating these design fiction objects and the use of workshop to generating idea.

Through analysis of case studies and literature, I have chosen to use an amalgamation of different approaches and methodologies from design fiction to help realise my project.

# Approach

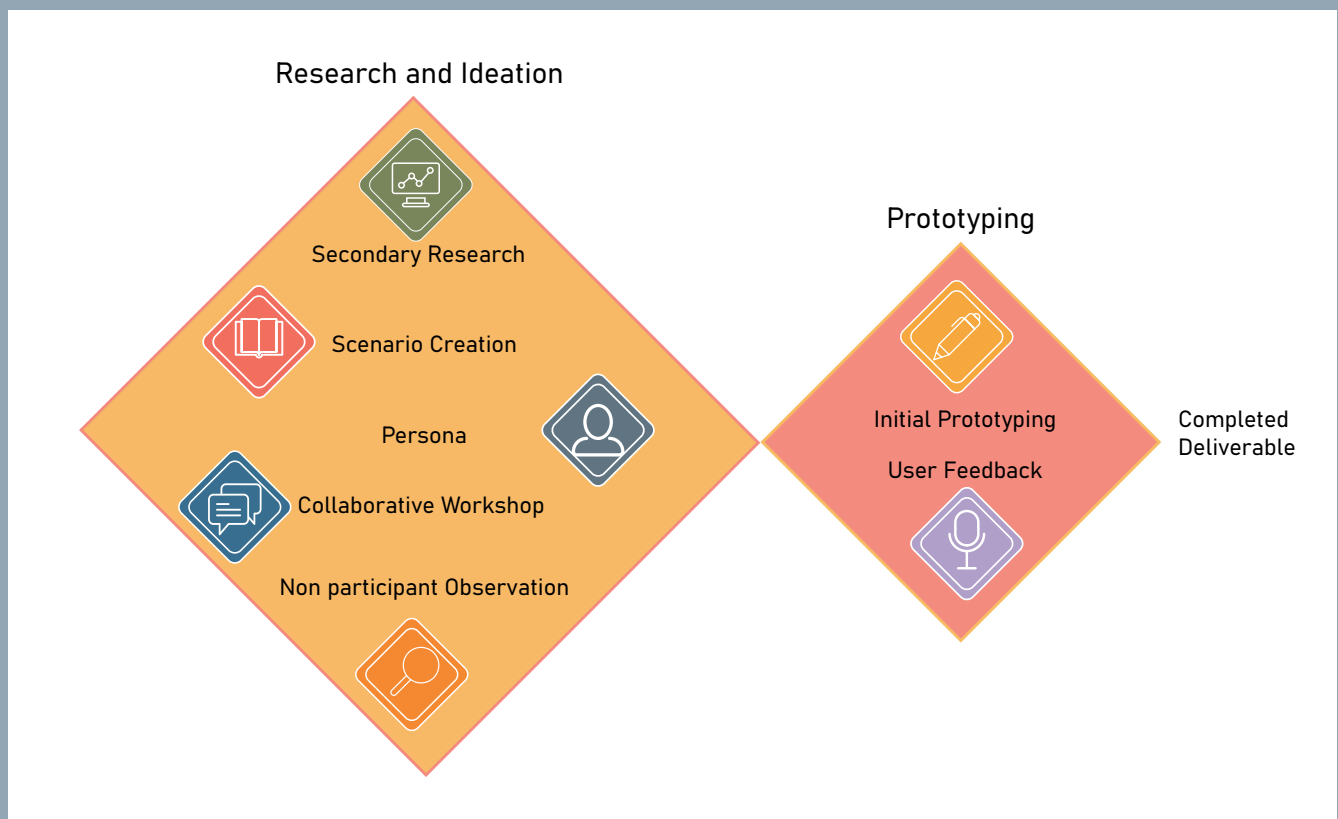
## Methods and Methodology

### Methodologies:

In this project I will use many different methodologies and approaches to result in my prototype. The design decisions will be informed from my research. Research methods being: Secondary research, Non participant, work shops. Each technique is used to create and explore an aspect for my design future object.

### Methods:

#### Double Diamond



The main structure of my overall methodology is a Double Diamond. This allows for me to get a complete understanding from each research technique using research loops. I have found the Double Diamond method previously a good technique to generate key insights and gather a complete understanding of a topic.

The structure of my Double Diamond will include a research phase as well as creation/prototyping phase. The methodologies I will use can be grouped into these areas: The research & ideas stage and then the creation of my physical object stage.

# Approach

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Some of the methodologies in more detail from my design approach.



## Secondary research :

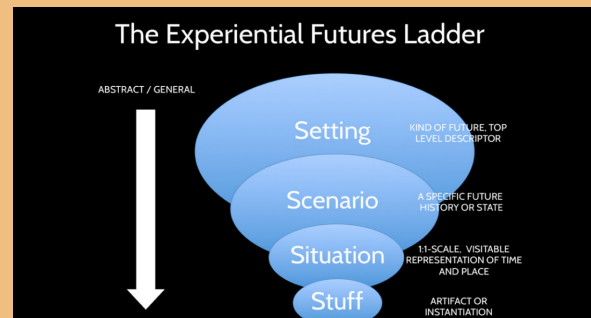


Secondary research infographic (FIG13)

In this section I will research Self checkouts energy demands of components as well as looking at how previous interfaces operated with low energy. I will also look at research for a scenario and look at design trends as well as trends in energy usage. Things like hidden energy consumers and parts. This is to provide a solid foundation for the next phase of the project.



## Scenario Building:



Experiential future ladder by Jacques Barcia (FIG14)

Scenario building will be to create a realistic scenario in preparation for my workshop and my whole project, this will be informed by my secondary research

Scenario building is an important step in creating a world for this object to exist and allows for me to conduct my user research and understand how people will interact and behave in a low energy future.



## Non-Participant observation :



Observation infographic (FIG15)

Non Participant observation involves observing how people act and interact with existing Self checkouts and analysing the user experience provided by them, their features.



## Persona creation :



Personas infographic (FIG16)

Creating persona based on my narrative scenario to inform participants in my collaborative workshop and consider aspects of the experience, accessibility and privacy issues.



## Collaborative Workshop :

I will hold a collaborative workshop to engage with people in the UX Design space. To gather ideas and insights into how my prototype should be conceived.



Currency converter, 99 cent futures by the exploration factory (FIG12)

### Rough Outline of the method:

I will plan, set up and conduct my workshop

### Step 1: Introduction and Content

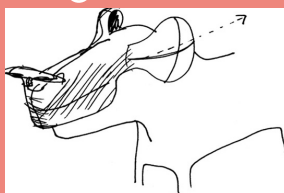
I will clearly define workshop goals and expectations in order to create a collaborative atmosphere without judgement that focuses on creative thinking and divulges the scenario.

### Step 2: Ideation and Brainstorming

Working in small groups, brainstorm ideas for how to create and problem solve the UX of a low-energy interfaces and how they will get around these challenges.



## Prototyping :



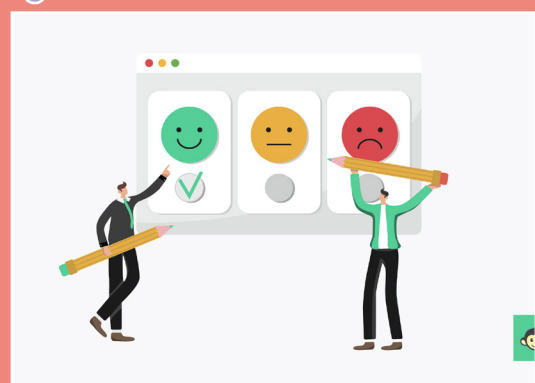
SPYMAKER by Antony Dunne and Fiona Raby (FIG 17 )

I will be creating the prototype of my self checkout of the future based on results from my research and workshop.

Prototyping is especially relevant as it allows someone to experience the object and allows for user feedback on how it feels and works. It is the final step to completing my outcome as set at the start.



## User Feedback :



Feedback inforgpahic (FIG18)

User feedback will be incorporated with the Prototyping to result in an accurate and usable prototype experience by the end of this project.

# Approach

## Realisation and analysis

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### Analysing Data:

When conducting the research through my project I will be using visualisations as a way to extract data from my research and to gather key insights.

For example I will use spreadsheets to record and analyse data from my secondary research. This will allow for comparison of evidence such as the effectiveness and efficiency of some interface types, power usage and more.

### Realising the approach:

#### Research and Ideation:

Secondary Research, Persona Creation and Scenario creation:

The results of the first 3 research methods will be recorded with software, my choice being google sheets and notion to record and compare data. I will gather insights from my secondary research to create user persona. My scenario will be visually represented in illustrator.

Non Participant approach and collaborative workshop:

I will carry out a non participant observation at a range of local supermarkets that cross social demographics, Co-Op, Aldi, Tesco's, Sainsburys, Waitrose. I will tally key observations in order to compare the user experiences.

I will set a time limit to make sure I don't have too much of a bias. Apps such as notion will be used to record data which allow me to create tables and record notes quickly about behaviours.

Carrying out my collaborative workshop will involve booking out a space at the university as well as recruiting people from my course and professionals who work as UX designers.

It will involve me completing my persona and scenario creation and stating clear goal and emphasizing feasibility within the time frame given I will also use photo documentation and notion to record what happens in this workshop.

#### Prototyping:

Prototyping and User Feedback Session:

The prototyping phase will be a research loop and involve creating initial ideas of the design from the research conducted in the first half of the double diamond. The initial interfaces will be created with Figma as it is easy to share designs, test the work and get feedback.

The next step will be creating the physical form.

My physical prototype will be informed by my research and testing phase it is not possible to say or specify what products, hardware and software I will use.

I will make small card models as part of the process of prototyping in order to make physical design decisions about usability.



# Approach

## Participants, ethics and limits

Realisation on the approach and methodology's on my work

### Participants

I will be using a small number of participants during some of my research techniques for user feedback on prototyping, non participant approach as well as for a collaborative workshop. My source pool for voluntary participants will consist of ux designers from both industry and university students to make up another section of my participant pool each being used for a type of research.

Insights that I aim to be provided by my participants when it comes to my Near future Self checkout :

- Implementing Security
- Exploring Accessibility
- Aesthetic Choices
- Functionality and required features
- Overall user experience evaluation of the prototype and current products

I plan to recruit through my university course, as well as using snowball sampling as I have a friend who works as a ux designer and can provide contacts to be involved with my project

### Ethics and limitations

Ethical Concern	Mitigation Technique:
Non voluntary participants confidentiality when conducting non-participant observation	Making sure not to record any forms of media and people face and descriptions only their actions with what I want to observe
Participant Consent	Providing all voluntary participants with a required consent form with the ability to change at any point
Security of participant personal data such as names and faces in the case of image for evidence being confidential	Providing participants with a way to contact me in case they want to remove their input to the project at any time

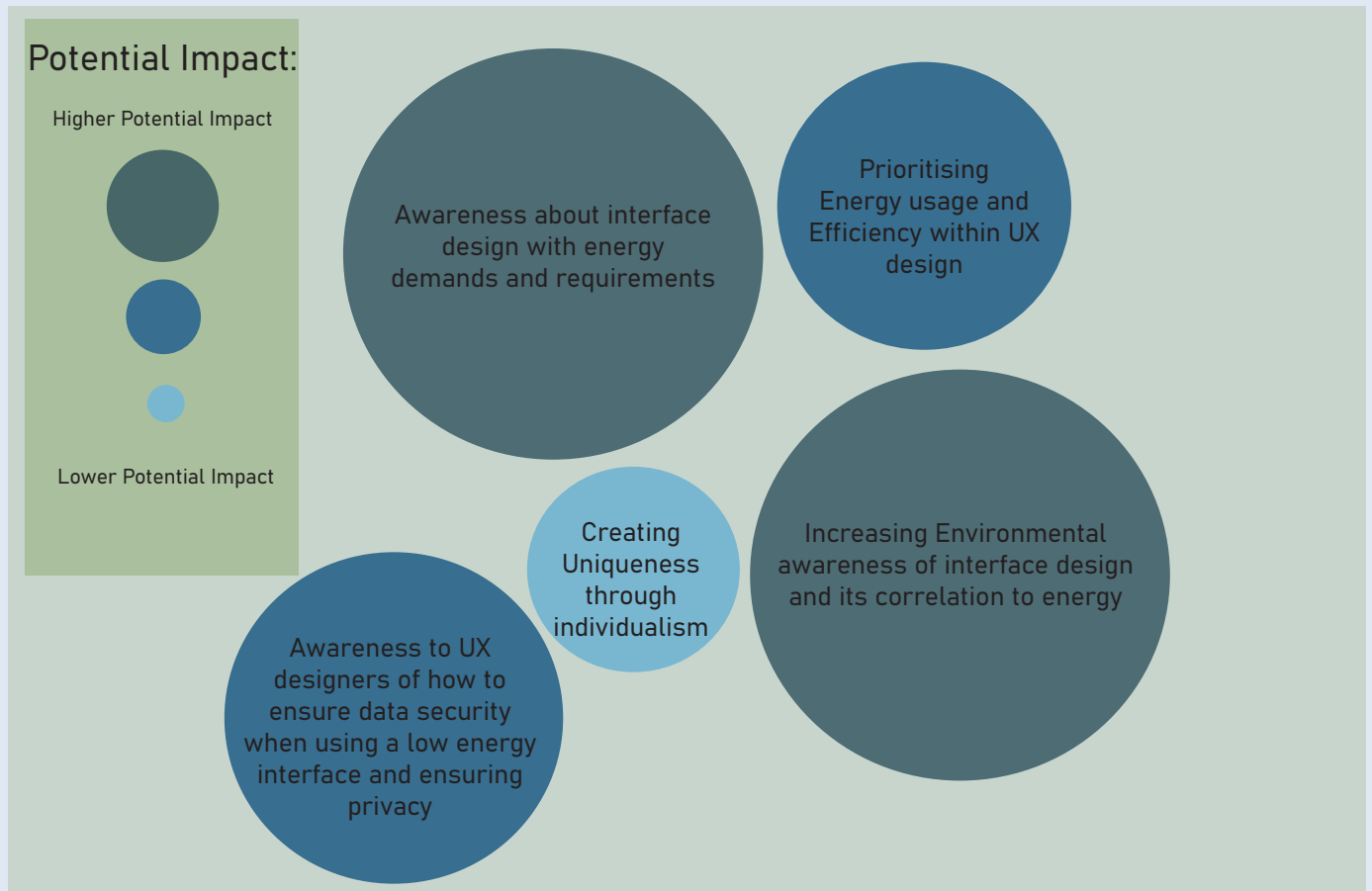
Limitations:

With this project limitations will be a constant factor, such as with the big one being time limit so it is important to keep my goals clear for each method and approach I use, as well as thinking about how this is a singular project and will not be used for wide spread usage as this is just a prototype of what it could look like.

# Influence

## Impact/contributions

Some of the Potential Impacts and Contributions that my projects research and object can affect on The UX Design Space.



Chat GPT 4 created images

# Phases Overview

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Overview of the phases and some potential challenges that can arise when carrying out each section.

Start



## Phase 1: Research



Objective:

- Secondary Research
- Creating user Persona
- Scenario making

### Potential challenges:

Information Accuracy, Relevance of Scope



## Phase 2: Ideation



Objective:

- Co Collaborative workshop
- Non participant observation

### Potential challenges:

Bias, Time Constraints, Clear Context/goal



## Phase 3: Creating and Realisation



Objective:

- Prototyping
- User Feedback

### Potential challenges:

Feedback Bias, Feasibility



## Phase 4: Completed Deliverables

Objective

- Completed Working Prototype

### Potential challenges:

Time Constraints

End

# Phases Overview

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In this section I will address how I plan to mitigate/ reduce the challenges in the phases of my project

## Phase 1:

### Information Accuracy:

Cross-reference information from multiple reputable sources. Prioritise academic publications, official reports

### Relevance of Scope :

Prioritising Goals of the Research, Clear Objective

## Phase 2:

### Time Constraints:

Prioritisation, time blocking

### Reducing Bias:

Having a third party record the workshop and having a clear workshop objective

### Clear Context/Goal:

Creating a simple and clear scenario easily interpreted

## Phase 3:

### Feedback Bias:

Having a third party analyse and conduct feedback on initial prototyping

### Feasibility:

Remembering the scope and setting goals with initial prototyping and feedback loops

## Phase 4:

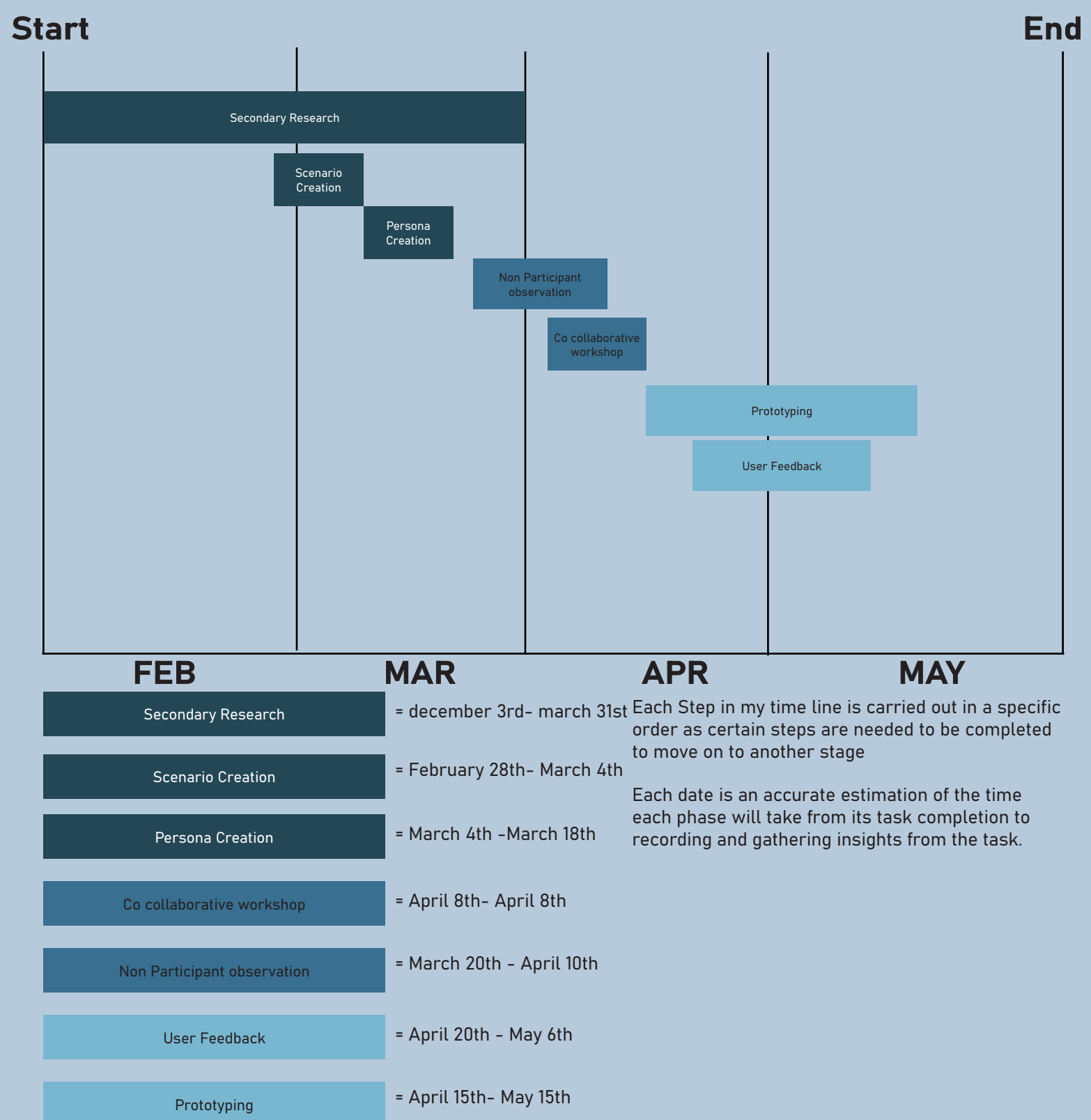
### Time Constraints:

Prioritisation, time blocking

# Project Timeline

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This is an over view of the time line of my project demonstrating order and date of completion of each task.



## Conclusion:

My Proposal is to create a interactive prototype of a low energy self checkout from a near future scenario to highlight the impacts of energy demands.

Using energy efficient interfaces and systems developed from employing different research techniques to create insights helping to inform the creation of the prototype self checkout and realise it for a practical human/machine interactive experience.



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