

# **5.**

# **Design and Make Principles: Product Analysis and Systems**

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## 5. PRODUCT ANALYSIS and SYSTEMS

# Visible Attributes of Products

### FORM and FUNCTION

These are the features that have an initial impact on the customer.

#### AESTHETICS

How a product looks, it's appearance.

- SHAPE
- COLOUR
- FORM
- TEXTURE
- USING
- FUNCTION - how you can work it?
- STYLING
- FASHION

Think about **ABOVE the LINE FEATURES** when looking at Visible Attributes—shape, colour, user interface.

**Visible Attributes** are very important - the visual appearance of a product can affect if the consumer would buy the product.

**User Interface** - Visible features on how the customer will use the product.



*These products have a unique visual appearance. This can affect the consumer's opinion of the product.*



## 5. PRODUCT ANALYSIS and SYSTEMS

# Modern Design & Styling.

This is how a designer would consider the appearance of a product.  
[Aesthetics]

Styling is important to a company so that their product carries a certain style and can be distinguished from other products. This can be shape, form, colour etc. Many products that basically do the same thing are on the market, but they are styled in a different way so they look different. This is the feature that would appeal to different customers or target audience.

Growth of mass production: Designers made products for mass production, these then reflected the machines that made them 'industrial design' meaning every product would look virtually the same!

Designers realised that by styling, consumers could distinguish products from competing products.

This can be done with any product by streamlining, smoothing or rounding off shapes. Examples of this can be seen in products such as trains, cars, staplers etc. Development of materials have helped this - sheet metal, plywood and plastics can be formed into shape.

Basically these kettles below have the same function but are styled differently. Which one would you buy?



*Even modern trains have been styled to improve aesthetics and performance*



*Styling of modern cars*



*Michael Graves 'Bird' kettle for ALESSI*



*'Hot Bertha' Kettle from Phillip STARCK*

## 5. PRODUCT ANALYSIS and SYSTEMS



Jonathan Ive was responsible for re-styling the appearance of a computer. The original iMac could be distinguished from every other type of computer because it's appearance was totally different—this was down to the consideration of styling and the aesthetics of the product. The Apple company is responsible for innovative styling in their product development. The knock on effect of this is that a number of other computer companies and manufacturers have realised that the styling of the product [shape & form] is important to selling their products.



*Designers develop and refine their ideas to improve their visual appeal [Styling]*



### RETRO STYLING

Retro styling is very popular, modern products are based on old designs but include new technology and refinement.



*1940 Roberts Radio*



*2000 Roberts Radio same design but with modern technology DAB Radio etc*



*1960 VW Beetle*



*2017 VW Beetle*



## 5. PRODUCT ANALYSIS and SYSTEMS

### Standards associated with Design & Manufacturing

#### ISO International Standards

Standardisation in the context related to technologies and industries, is the process of establishing a technical specification or standard among manufacturers in a global market. This will bring benefits to everyone concerned. A M4 threaded screw would be the same in the UK, Europe, USA or China. A hand torch designed and manufactured in China could have a standard AAA Battery holder that would be standard in any country.

All of Europe now uses 230 volt 50 Hz AC mains electricity. The metric measuring system is standard across the world.

Most of the products we buy depend on these standardisation—Battery powered products, TVs, nuts and bolts, light fittings, CD Players.

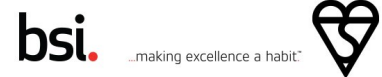
The industry standard is the ISO 9001—millions of manufacturing companies around the world from over 160 countries have acquired this accreditation. Companies and businesses use this standard to demonstrate their ability to provide products and services that meet customer and regulatory requirements.



#### BSi - British Standards Institution

British Standards Institution (or BSI), is the national standards body of the United Kingdom. BSI produces technical standards on a wide range of products and services, and also supplies certification and standards-related services to businesses. It serves the interests of a wide range of industry sectors as well as governments, consumers, employees and society overall, to make sure that British, European and international standards are useful, relevant and authoritative.

Products have to comply with this standard before they can be sold to the public.



#### Kite Mark

Products have to comply with safety regulations.

Consumers have confidence in products if they have the kite mark they know that they are safe.



*The Kite Mark used on products that have passed BSi safety regulations*

#### EUROPEAN REGULATIONS

The **CE marking** certifies that a product has met EU consumer safety, health or environmental requirements. Consumers in Europe can have the confidence that the product has passed these tests when buying the product.



*"Conformité Européene" translates to European Conformity*

## 5. PRODUCT ANALYSIS and SYSTEMS

### QUALITY MARKS ON PRODUCTS

Manufacturers have quality marks on their products. These quality marks usually show that the product has been tested for a certain quality.

#### Toys

Toys could be tested for Choking hazards, finger traps, toxic finishes, sharp items. The packaging would have logos showing that the product has none of the hazards.



*Toys would have regulations regarding choking hazards*

#### Furniture & Clothing

Fabrics, furniture, clothing can have a flammability test. They would carry a Logo showing that they have passed a flammability test.



*Furniture have regulations regarding fire hazards*

#### Food Products

Food can be tested. Eggs would have the Lion Quality Mark on them. Farm produce would have the Food Standard Assured Logo.



*Food would have regulations regarding quality and source*

#### Safety Equipment

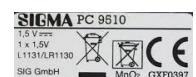
Crash helmets would be impact tested to see if they would protect a humans head.



*Safety equipment would have to pass tests to prove that they are suitable for purpose*

#### Electrical products

Electrical products will have been tested for safety.



**If a product carries these quality marks the customer will have confidence in the product.**

*Electronic products carry safety marks to prove that they have passed safety tests*

## 5. PRODUCT ANALYSIS and SYSTEMS

# Comparing products by evaluation



*iPhone 3 Launched 2009*

**2009**

**2017**



*iPhone 8 Launched 2017*

KEY CHANGES	REASON
<b>SIZE</b>	The size of the iPhone 8 is larger than the iPhone 3 but the iPhone 8 has many more features and functions of the smaller iPhone 3. Due to technological developments battery size has been reduced. Computer components are getting smaller but more powerful so more features and functions can be incorporated into the product.
<b>SHAPE/FORM</b>	Technological developments in manufacturing processes have enabled the designers to use more advanced materials. The casing of the phone can be formed into a more complex, thinner shape but still have the strength. Glass technology has enabled Apple to make the display with much higher clarity than the original version.
<b>FUNCTION</b>	The iPhone 8 has many more features—better quality camera, more memory, superior display, processor speed.

These developments have occurred by continual evaluation of products and the continual need for improvement.

- Improvements come from analysing on features that can be improved.
- Feedback from consumers.
- Analysing similar products from competition.
- Technological development—what are the current technological developments that can be used on a newer version?

## 5. PRODUCT ANALYSIS and SYSTEMS

# EVOLUTION of PRODUCTS

Why do products develop or change over time?



*1960s electric kettle*



*2000 electric kettle*



*2017 electric kettle*

Products change over time. This is called **EVOLUTION**.

The above product has changed over time:-

The main changes are

**1.SHAPE**

**2.MATERIAL USED**

**3.TECHNOLOGY**

### SHAPE

This is due to styling - designers are more aware of making their product different from its competitors. This is also possible because of the material. Polypropylene plastics are used for the modern kettle body. Polypropylene can be injection moulded into very complicated shapes and forms. This could not have been done 50 years ago because the material was not available. Due to this material designers can be more creative with their design work. Because mild steel was used 50 years ago the shape was limited to the working properties of the material. Manufacturing techniques have improved and been developed over the years so this has affected shapes and forms of many other products .

### MATERIAL

Polypropylene is used for the body which has better insulation properties than steel. Modern plastics can be formed into interesting shapes and forms by using complex injection moulding processes.

### TECHNOLOGY

Some modern kettles have Smart Materials or Thermochromic ink in polymer panels that change colours when hot. Sensors inside kettles switch them off automatically when water is boiled to save energy and to be safer. These types of technology weren't available in the 1960's.



## 5. PRODUCT ANALYSIS and SYSTEMS

# ENVIRONMENTAL ISSUES

**Some products have been re-designed in consideration of the environment**

All of these products have been developed with the environment in mind. Wind up radio and calculator saves the need for batteries. Plastic bags have been re-designed with the environment in mind by using a different material that decomposes naturally.

Garden lamps that need no wiring or electricity.

Cars have been re-designed with consideration to environmental issues. Better fuel consumption, fuel cells, rechargeable batteries.



*Solar panels on calculators and garden lamps*



*Solar panels on roofs are quite common these days*



*Wind up radios and Torches      Cars with rechargeable energy*

## GLOBAL WARMING and CLIMATE CHANGE

Many of the changes are in response to Global Warming and the climate change. Global warming is caused by a phenomenon known as the greenhouse effect. A greenhouse (or glasshouse) is good for growing things because it traps heat inside and stays hotter than the atmosphere around it.

Global Warming is caused by the build up of the greenhouse gases such as carbon dioxide. When people use fossil fuels like coal and oil, this adds carbon dioxide to the air. When people cut down many trees (deforestation), this means less carbon dioxide is taken out of the atmosphere by those plants.

In response to this Governments around the world are attempting to reduce the emission of harmful gases into the atmosphere.

Many countries adhere to this but unfortunately many do not. Major manufacturing countries like China still depend heavily on fossil fuels for their manufacturing processes.



*Many countries depend heavily on Fossil Fuels in their manufacturing processes*

## 5. PRODUCT ANALYSIS and SYSTEMS

### Government Policies and Legislations

Government policies have an effect on how designers address problems for example:-

Policies state that products must have:-

- Eco Labels
- Low sulphur diesel
- Lead free petrol
- CFC free Aerosols
- Flammability standards on furniture
- Since 2011 in Wales all plastic bags used at supermarkets must be paid for—5p charge. This encourages people to RE-USE their bags. Some retailers are reporting reduction in the use of plastic bags of between 35% - 96%.



*Products carry Labels stating that they conform to legislations*

Usually if these products do not conform to the government requirements the consequences will result in higher taxes or financial penalties.

On the other hand due to the extra work and development involved in developing the product the product can be sold for a higher price.



Some cities have car free zones to reduce emissions.

**UK Government have intention of banning the sale of Petrol and Diesel cars from 2040. Designers of all form of transportation will face challenges to develop new practical forms of transportation that will not use oil based fuels.**



*The New Tesla and Nissan Leaf Electric cars are already available in the UK*



*UK will ban all Petrol and Diesel cars from 2040*

## 5. PRODUCT ANALYSIS and SYSTEMS

# INTELLECTUAL PROPERTY

Intellectual property is a right that is bestowed by the Patent Office which gives legal recognition to the ownership of brand names and gives the proprietor the right to prevent other people from exploiting or copying their property. Intellectual property rights apply to **FOUR** different areas:

1. Registered designs and the design rights
2. Registered trade marks
3. Patents
4. Copyright

These Intellectual Property rights enable innovators access to a system by which they can benefit from their ingenuity. Typically the rights may be sold, licensed to others or used to safeguard investment in new ventures.

## DESIGN RIGHTS

**Design is all about the way an object looks: its shape, its visual appeal...it's all in the design.**

### Registered Design

A registered design is a **monopoly right** for the **appearance** of the whole or part of a product, resulting particularly from the features of lines, contours, colours, shape, texture and materials of a product or its ornamentation.

These designs could be anything from patterns on textiles or plates to the shape of a car or the design of part of a product, such as a kettle handle.

- **Protects** only the **visual appearance** of an object.
- **Lasts** for an **initial** period of **5 years**.
- Can be extended in four 5-year terms to give protection for a maximum of **25 years**.
- Becomes a property which can be bought, sold, hired or licensed.

The features of the design can be as follows:

- **Shape** and **configuration** (three-dimensional);
- **Pattern** and **Ornament** (two-dimensional).



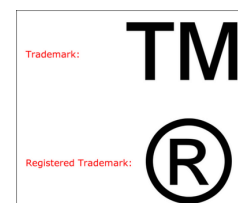
*The products have **DISTINCTIVE** external shapes. The shapes are protected by a Registered Design*

## 5. PRODUCT ANALYSIS and SYSTEMS

### Registered Trade Mark

Trade marks are symbols (like logos and brand names) that distinguish goods and services in the marketplace.

- A sign which may be **represented graphically**.
- Distinguishes the goods or services of one company from another.
- May include **words, designs, letters** and the **shape of goods** or their **packaging**.
- Provides legal protection.
- Application fee of £200 and a further £50 for each other class.
- Lasts indefinitely, **lasts 10 years** and can be **renewed every 10 years**.



*These Logos are Graphical products and have been protected by a Trade Mark TM or ®*

## 5. PRODUCT ANALYSIS and SYSTEMS

### COPYRIGHT

Copyright protects many types of work, from music and lyrics, photographs, books and knitting patterns.



### AUTOMATIC RIGHT

You don't have to apply for copyright protection. So whether you write a book, take a photo, or compose a song, it's automatically protected.

It may help protect your work by displaying the © symbol, your name, and the year in which it was created.

Buying a copyright protected work doesn't give you the right to broadcast or copy it – even for private use (e.g. making copies of CDs).

Using copyright protected works usually requires contacting the owner or a collecting society who may agree a licence.

### PROTECTION

There will usually be more than one copyright associated with a song. If you are the composer of the music you will be the author of the musical work and will have copyright in that music. The lyrics of the song are protected separately by copyright as a literary work and will usually be owned by the person who wrote them. The term of protection for an original musical and literary work is the creator's life plus **70 years** from the end of the year in which he/she dies.

If a song is recorded then copyright in this **sound recording** lasts for **50 years** from the end of the year in which it was made or, if published in this time, **50 years** from the end of the year of publication. If the recording is not published during that 50 year period, but it is played in public or communicated to the public during that period, then copyright will last for 50 years from when this happens.



## 5. PRODUCT ANALYSIS and SYSTEMS

### PATENTS

Patents protect the features and processes that make things work. This lets inventors profit from their inventions.

Once your invention is patented no one can copy, make, sell, or import your invention without your permission.

A patent protects new inventions and covers how things work, what they do, how they do it, what they are made of and how they are made. It gives the owner the right to prevent others from making, using, importing or selling the invention without permission.

Your invention must:

- be **new**
- have an **inventive step** that is not obvious to someone with knowledge and experience in the subject
- be capable of being **made** or **used** in some kind of industry.

A patent gives you the right to stop others from copying, manufacturing, selling, and importing your invention without your permission. The existence of your patent may be enough on its own to stop others from trying to exploit your invention. If it does not, it gives you the right to take legal action to stop them exploiting your invention and to claim damages.

The patent also allows you to:

- sell the invention and all the intellectual property (IP) rights
- license the invention to someone else but retain all the IP rights

<https://www.gov.uk/government/organisations/intellectual-property-office>

## 5. PRODUCT ANALYSIS and SYSTEMS

# INTELLECTUAL PROPERTY—Overview

1. Patents
2. Trade Marks
3. Copyright
4. Designs

**Protects the rights of the designer** - he can sell the design or he will gain financially if his design is used by someone else with his permission.

	PATENTS	TRADE MARK	REGISTERED DESIGN RIGHT	COPYRIGHT
<b>Time</b>	20 years must be renewed every year	Lasts for ever; renewal every 10 years	Up to 25 years	70 years after the death of the author
<b>Protection:</b>	In the UK	In the UK	In the UK	The World
<b>Protects against:</b>	Your idea being sold or made by someone else	Use of your logo or trade mark by others	Your product being copied or sold	Your work copied or used without your consent
<b>What is protected:</b>	Inventions	Brand identity, words, Logos and signs	Appearance of the product - shape	Music, art, film, books and broadcasts

## PATENT

### *Dyson (2001)*

The vacuum-cleaner designer took legal action against Hoover after Hoover launched its 'Vortex' vacuum cleaner using a process similar to Dyson's dual cyclone vacuum cleaner. Hoover was found to have infringed Dyson's patent and Dyson has received substantial damages for the impact of the infringing Hoover machine on the sales of Dyson vacuum cleaners. Hoover received an injunction preventing it from using Dyson's technology, even after expiry of the patent.



## COPYRIGHT

Music, films, books. There are many issues with people illegally downloading music or films from the internet without paying for them. Here the creator suffers because he doesn't get any financial reward for his work.