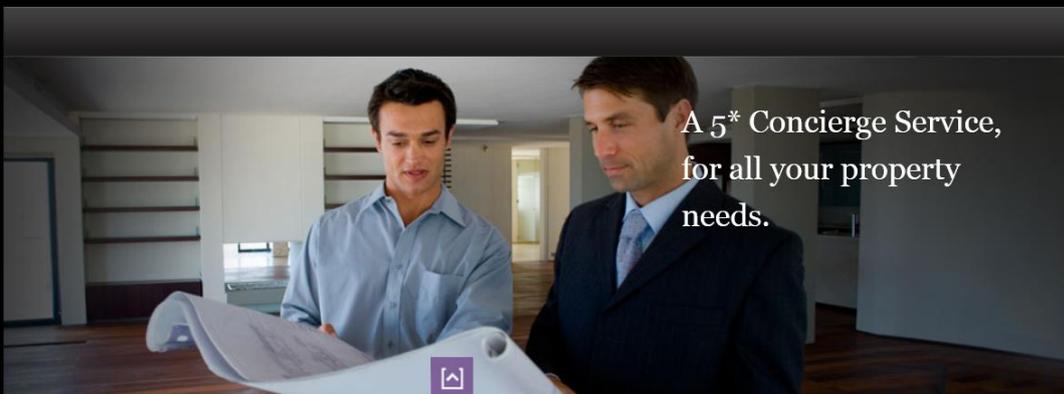


# Winsper

## Property Specialists

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## Design Management Function & Form



As At  
06 October 2013

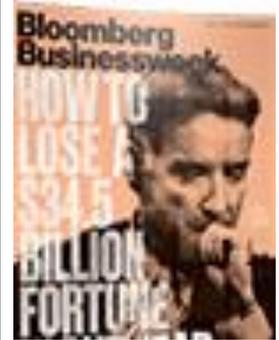
Author  
D Winsper

Consider the 'Design Environment' and evaluate general design requirements.

- What does a design need, to achieve an effective function?
- How does Form relate to function and influence design?

Within the 'Design Environment', consider a product of effective Design Management.

## IS FUNCTION A NECESSITY OF DESIGN, OR IS DESIGN SUBSERVIENT TO FORM?



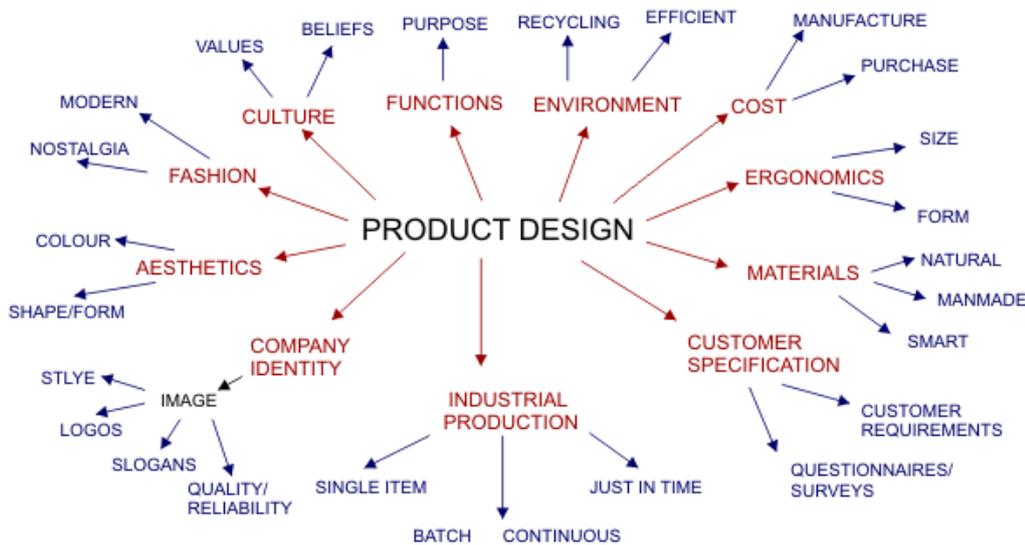
### The Design Environment

1. Design, the single act of intuitive creativity and 'abductive thinking'<sup>1</sup>, is overarched by 'Design Management' and as such exists within frameworks of innovative process. The design itself, once conceived, is ever evolving, through these frameworks and is influenced by such factors as;



**DMI**

DESIGN MANAGEMENT INSTITUTE



### Design Management

2. Thus, within the 'Design Environment', 'Design Management' has developed, to encompass frameworks and process. 'Design Management' has been defined by the Design Management Institute (DMI)<sup>2</sup> as;

*“Simply put, design management is the business side of design. Design management encompasses the ongoing processes, business decisions, and strategies that enable innovation and create effectively-designed products, services, communications, environments, and brands that enhance our quality of life and provide organizational success.”<sup>2</sup>*

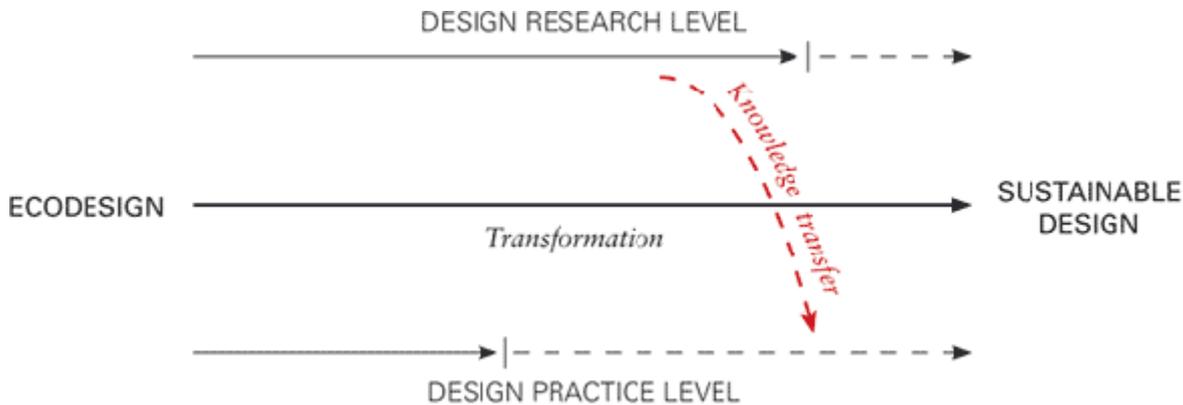
3. Jerrard and Hands 2008<sup>3</sup> purport 'Design Management' to be;

*"Organising innovative activity or constructing frameworks within which design takes place."*<sup>3</sup>

4. The DMI<sup>2</sup> c1998 asked eighteen industry leaders on their views of 'Design Management', for a DMI Paper<sup>4</sup> and all variations were in tune with the above two definitions.

### The Design Life Cycle - Sustainability

5. 'Design Management' and thus the 'Design Environment' never remain extant and is constantly evolving. Throughout the 90's, Eco-Design was born as a product of the UN Conference On Environment & Development, Earth Summit 1992<sup>5</sup> and the further Protocols and Agendas that have followed. Eco-Design has further morphed into sustainability and both Designers and Clients alike are now also concerned about the designs 'Life Cycle', including recycling and up-cycling.



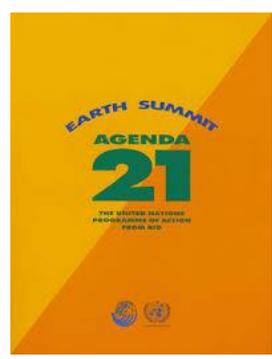
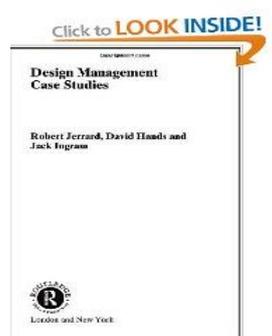
### The Design Form – Aesthetics

6. Function should be a primary driver of the design of the object, however, increasingly in a modern, capitalist society, 'Form' or 'Aesthetics' is having an ever increasing pull, combined with relentlessly evolving technology. It is acknowledged, McDermott, 1994, that Form / Aesthetics has fallen from the 19<sup>th</sup> Century 'Aesthetic Movement' and developed over time, in combination with the 'Modern Movement', linking aesthetic intention with industrial process and mechanisation. However, has Form surpassed Function, in the ever increasing need for products to be profitable?

### Case Study – The Vehicle Wheel / Tyre



7. To highlight this point, first principles will be reverted to and thus the exemplar will be the Wheel / Tyre, which was born out of a 'Design Environment', however archaic, in the 4<sup>th</sup> Millenium BC and thus allows synthesis and understanding over a protracted time frame, of Function and Form.



## Function – The Wheel / Tyre

8. The wheel (Complete with axle), as defined by ‘Renaissance Scientists’, is one of the ‘Six Classical, Simple Machines’. Its Function, as defined, is;

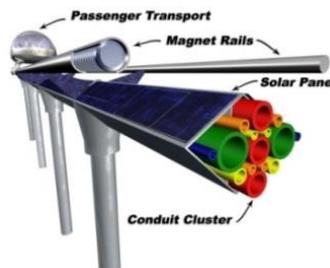
*“The simple machine called a wheel and axle refers to the assembly formed by two disks, or cylinders, of different diameters mounted so they rotate together around the same axis. Forces applied to the edges of the two disks, or cylinders, provide mechanical advantage. When used as the wheel of a cart the smaller cylinder is the axle of the wheel, but when used in a windlass, winch, and other similar applications the smaller cylinder may be separate from the axle mounted in the bearings. Assuming the wheel and axle does not dissipate or store energy, the power generated by forces applied to the wheel must equal the power out at the axle. As the wheel and axle system rotates around its bearings, points on the circumference, or edge, of the wheel move faster than points on the circumference, or edge, of the axle. Therefore a force applied to the edge of the wheel must be less than the force applied to the edge of the axle, because power is the product of force and velocity”<sup>6</sup>*

9. Thus, its Primary function, over time, remains extant and through the objects evolution and advances in technology, various secondary and tertiary functions have evolved. That of;

- Ergonomics – Ride Height, Comfort, Vibration Control etc.
- Health & Safety – Grip, Control, Stopping Distances etc.
- Sustainability – Raw Resources, Recycling, Up-Cycling etc.
- Production – Economics, Cost, Mass Manufacture etc.

Amongst others.

10. However, conversely it is these very advances in technology, driving these tertiary functions that will eventually make the vehicle wheel / tyre obsolete. As demonstrated by the MagLev<sup>7</sup> Transportation System below;



## Form – The Wheel / Tyre



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**World's Fastest Train Resumes Trials as Japan Plans Maglev Line**

By CHA GYUN & KIMBERLY MERRILL Aug 28, 2013 7:07 AM EDT (UTC)

Japan resumed trial runs for the world's fastest magnetic-levitation train that will complement the Shinkansen bullet train network when ready in 2027.

Central Japan Railway Co. plans to begin work on the 5.1 billion yen (\$52 billion) maglev line between Tokyo and Nagoya as early as April. Trials resumed today after the company spent five years building a 24-kilometer extension of a test track. The trains can run at speeds of up to 500 kilometers (310 miles) per hour.

The maglevs will whisk passengers to Nagoya, a city of 2.3 million people, from Tokyo in as little as 40 minutes for the 200-kilometer journey, from as short as 20 minutes now, according to JR Central. Faced with the challenge of tunneling under Tokyo's skyscrapers and the Japanese Alps,

11. As demonstrated by the above pictures, the modern, aesthetic, even artful vehicle wheel / tyre does not conform to one form, but occupies the complete spectrum and whilst function still exists, the product has been usurped by the end users requirement, in relation to form. This can be viewed as a true reflection of Capitalism and again points to the driving force, in the relationship between Function and Form.

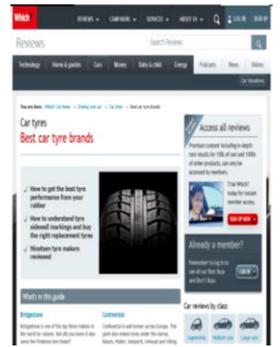
12. To drill down further, this paper now concentrates on one product, a mid range tyre, conforming to size, speed and safety rating parameters. That of a Goodyear<sup>8</sup> P215/65R15;



## Investigative Analysis

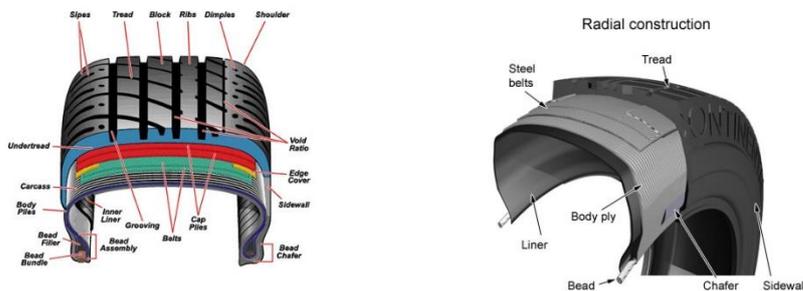
13. The following parameters can be ascertained and are both objective and subjective;

Design Criteria	Perceived Quality & Score						Remarks
	E	VG	G	A	P	VP	
Fit For Purpose		5					Motor Vehicle Tyres (Safety) Regulations 1994 <sup>8</sup>
Ergonomic Efficiency			4				Which Magazine – Tyres <sup>9</sup>
Visual Appeal			4				Which Magazine – Tyres <sup>9</sup>
Complexity of Design			4				Which Magazine – Tyres <sup>9</sup>
Ease of Replacement			4				Which Magazine – Tyres <sup>9</sup>
Disposability	6						Subjective
Sustainability			4				Subjective
Cost			4				Subjective
<b>Totals (48HS)</b>	<b>6</b>	<b>5</b>	<b>24</b>				<b>35 Out Of 48.</b>



Just like any object / product, industry, consumerism and thus capitalism evolves many variations on a theme, all of which are constantly developing. Objectivity exists through legislation, conformation, trails and development and the plethora of consumer testing that is available, in raw data/knowledge that can be transposed into meta-data/knowledge.

## Disassembled Tyre – Component Parts



## Performance

14. Tyre performance is directly related to cost and overarched by legislation. All tyres, irrespective of brand must conform to Legislation, thus every modern tyre employed to function in role, is fit for purpose. However, technological boundaries are always pushed and evolved and as such tyres are produced within the same business organisation that cater for all eventualities, above and beyond the British Standard. Ultimately, this leads to consumerism, headed by cost, but kept in check by market conditions, i.e. competition.

## Design

15. All tyre designs conform to the primary, secondary and tertiary functions, as now enshrined in law. It is the steps taken in the technological field that ultimately improve function above and beyond that which is required by legislation and ultimately render the product obsolete. It is Form however, which gives the object longevity, the aesthetics of which allow for consumerism and dictate market conditions and the commerce that envelops the product / object.

## Overall Analysis

16. From 'Big Picture' Design to an individual exemplar, the following analysis is drawn;

- The need / requirement for an object / product to fulfil a Function will always exist and hence inventors will continue to invent. Likewise Designers.
- Once the object / product has been established, usually through the Intellectual Property Office (IPO)<sup>10</sup> it will fall under legislation, to which function then becomes intrinsically linked.
- Ever evolving technology and new innovations in raw material production etc, will ensure that objects evolve within the functional sphere. This advances civilisation.
- In conjunction, capitalism, consumerism and market forces impinge on form and as such the aesthetics of the object will be in a constant state of flux, trends dependent.
- Increasingly, the 'Trend' of sustainability is an influencing factor on design, from both perspectives, that of Form and Function.
- Is 'objectivity' and 'subjectivity' that different, given the plethora of consumer testing and evaluating organisations in existence and thus, as such do we all have the ability to synthesize and evaluate raw data / knowledge and convert it into meta data / knowledge resulting in a sound, reasoned opinion, from processed thought.
- Object functional Performance increases over time, but there is no guarantee that form / aesthetics will mirror the increase. As beauty is in the eye of the beholder.

## Summary

17. The 'Design Environment' is born from 'abductive thinking' and once alive, conforms to 'Design Management', in various guises. These management frameworks support both 'Functional' and 'Form' (Aesthetics) aspects of the design creation and evolution. The advancement of time, technology and the user markets, has a profound effect on both Form and Function, although it is the functional side of the object that will always advance to the right.



**[E Signed]**

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