

*Beyond the Wall: an
investigation into the
relationship between industrial
design and science fiction*

A Thesis presented in partial fulfilment of the
requirement of the degree of Master of Design

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The study aimed to develop a theory describing the nature of the relationship between industrial design and science fiction, based on the observation that science fiction can inspire industrial designers and enrich industrial design processes and products. The hypotheses were that:

1. The roles of industrial design and science fiction are based on parallel ideas.
2. Industrial design is suffused with, and sympathetic to, science fiction thinking.
3. There is a 'cause and effect' relationship between aspects of industrial design and science fiction. Science fiction cinema is a key 'cause and effect'.
4. Science fiction cinema performs a key function in the roles of science fiction, and cinema can be employed to explore and discuss the roles of industrial design and science fiction.

The study used a range of research methods. An extensive literature review critically compared and analysed the characteristics and roles of science fiction and industrial design. The analysis identified contrasting and common themes, ideas, processes, texts and subtexts between the two areas. The findings were further analysed using graphic analytical tools, to form models that described and structured the industrial design/science fiction relationship. Three case studies were used to further test the model: the work of industrial designer and visual futurist Syd Mead; science fiction author Bruce Sterling; and the industrial design and production design content of selected science fiction films. Analysis of an Internet discussion among industrial designers also illuminated the model.

The findings from the analysis and the case studies supported the validity of the original hypotheses. The study identified as the key elements of an emerging theory the parallel ideas of innovation in industrial design and novum (the new thing) in science fiction; the cause and effect relationship found between the two disciplines; the parallel concepts of *mediation* and *responsibility* in industrial design, and *anticipation* and *interrogation* in science fiction. The theory was presented as a graphic model that demonstrated these elements.

This study concludes that science fiction challenges the design profession to produce better design by requiring that social, political, and technological contexts in which products will exist are explicitly understood and addressed. This is mapped out in an emerging theory that outlines a complex, multi-layered relationship between industrial design and science fiction. In industrial design terms, this emerging theory could be considered a prototype.

Dedication

To Robert Tocher (1947-1999) who I hope would have been proud of me, and to Dr. Ephra Garrett, who I know is.

Family

Linden Loader, Duncan and Chloe Garrett, Keriatu Stuart, Dr. Ephra Garrett.

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Affection

The emotional connection that a user develops with a product.

Canon

Film studies authors Roberts and Wallis (2002) describe the canon as “The list of works that ‘everyone’ agrees that everyone else should know” (Roberts & Wallis, 2002. p.1).

CAD

Acronym for Computer Aided Design – an umbrella term that covers a range of software and other computer-based design processes.

Designer

Used in this study to describe a person with formal design training involved in the product development process.

Director

The director is the person who takes the most individual credit for a movie. They are usually employed by the producers and provide the vision for the production. Movies are a very complex product, and exhibit the influence of many different people in the end result. However, the director is the person who makes the majority of the decisions relating to the final product.

Monomyth

The monomyth is the story at the root of many heroic tales. The concept, often termed ‘the hero’s journey’, is based on the writings of Joseph Campbell. The basic structure of the tale is repeated in many stories and media, and follows the pattern of a man being told he has hidden talents/powers, being forced by

tragedy to leave home on a long journey, receiving mystical aid, and finally conquering evil. This basic pattern is evident in stories ranging from Homer's *The Iliad* to George Lucas's *Star Wars* (1977).

Product placement

Product placement is the commercial practice of placing existing products (or, in the case of science fiction movies, possible products) into a movie. The product or brand is promoted by association with the story, the lifestyles depicted by the movie, or the actors themselves. This is a common practice, although product placement in science fiction movies often requires the design of new products, as contemporary products would be anachronistic in a future world.

Production design

Every aspect of the physical world of a movie, including products, clothes, vehicles, software, graphic design, architecture and town planning, is selected or designed to support and enhance the narrative. This is generically referred to as 'production design'. Science fiction films have a specific set of production design issues if they are to create a believable future world.

Product

The result of the manufacturing process –the object / product that is being designed and produced.

Product technologies

The technologies within the product that make it work – for example, LCD screens, circuit boards.

Production technologies

The processes used to manufacture the product – for example, injection moulding.

Profession

Used in this study as an umbrella term covering both professional and academic design practice.

Science fiction / sci-fi / SF / sf

There is some debate in the literature about the how the term 'science fiction' should be contracted. Three variations are used:

- sci-fi;
- SF;
- sf.

Hartwell (1996) for example, draws a distinction between SF and sci-fi: his view is that sci-fi is what appears on television or at the cinema, but that 'true fans' of the genre use either SF or sf as contractions. In terms of this study, distinctions of this nature are unimportant: the full term 'science fiction' is used.

Semantics

The visual language that a product uses to communicate its purpose, operation and intention.

The Sublime

The concept frequently attributed to the 3rd Century Greek philosopher Longinus that describes the effect of excellence in literature. In the 18th Century, Edmund Burke expanded the concept of the Sublime to encompass the powerful emotive responses that could be generated by works of art and literature (especially poetry), constructed spaces and natural phenomena.

The field of the sublime comprised the majestic, the awe-inspiring, and the literally overpowering: it spoke the language of excess and hyperbole to suggest realms beyond human articulation and comprehension. The sublime was constituted through the combined sensations of astonishment, terror and awe that occur through the revelation of a power far greater than the human. (Bakatman, in Kuhn, (Ed.), (1999 p. 255))

User

Used in this study to describe the person who uses a product.

Novels

- *Frankenstein (or, the Modern Prometheus)*. (Shelley, M. 1818).

Variouly hailed as the first major work of science fiction and a classic of horror fiction, Mary Shelley's *Frankenstein* is responsible for many of the images associated with both genres. The term Frankenstein is usually linked with the image of the shambling monster portrayed by actor Boris Karloff in the classic 1931 movie (stiches on his forehead, a bolt through the neck), although Frankenstein is the name of the monster's creator rather than the monster himself. The narrative follows the experiments of the scientist Frankenstein as he creates life in the form of the now well-recognised monster who, spurned by his creator, turns on Frankenstein and escapes to find his lonely death in Arctic waters. Science fiction's interest in the morality of the idea is clearly evident, as is the use of emerging technologies (Frankenstein harnesses electricity to jolt his creation into life).

- *Foundation*. (Asimov, I. 1951).

A product of the Golden Age of science fiction, Isaac Asimov is one of the Grand Masters of Science Fiction and was mentored by the 'other' influential pulp editor John W Campbell (the first editor being Hugo Gernsback). His three-book Foundation series, initially published as individual stories in Campbell's magazine *Astounding Science Fiction*, is set in the far future, in a galaxy populated by humans who originated on Earth. Asimov's background as a biochemist imbues the works with an air of solidity, and his science fiction ideas are broad and ambitious. The *Foundation* series is seen as one of Asimov's two great works (the other is his Robot series, for which he invented the 'three laws of robotics'), both of which are part of the science fiction canon.

Films

- *Metropolis*. (Lang, F. (director). 1926).

Fritz Lang's *Metropolis* was one of the last of the silent movies and is the first landmark in science fiction cinema. The movie is regarded as a classic, not only as a science fiction movie but as a benchmark piece of movie making. The theme parallels that of many other dystopian statements such as Aldous Huxley's *Brave New World* (1932) and George Orwell's *1984* (1949) with an exploration of the city as machine and the place of people within it. The narrative is a simple allegory of the triadic relationship between power, those who wield it and those under its control, but it is the visual aspects of the movie that exhibit the most power. The future of *Metropolis* is grandiose for a minority and troglodyte for the remainder, and the production design reflects this slant. The sets and architectural design for *Metropolis* remain iconic, although the design of products and vehicles is gestural and deals with the ideas behind them rather than the design of the objects themselves.

- *Things to Come*. (Menzies, W.C. (director). 1936).

The other early landmark in science fiction cinema takes the predictive ideas in H.G. Well's novel *The Shape of Things to Come* (1933) and gives them cinematic flesh in a movie whose acting and production values typifies British cinema of the period. The story follows the residents of 'Everytown', who (in a sequence eerily predictive of the Blitz, four years in the future at the time of the film's release) are bombarded by air at the start of a fifty-year war. The last third of the movie is set in the city as rebuilt by benevolent technocrats, and discusses the value of progress. The concept of progress is visually expressed through the design of Everytown, a uniformly Streamlined Moderne construction (in which everyone wears Greek robes), through the design of aircraft inspired by Norman Bel Geddes and the point of argument itself; the launching of a spaceship aimed at the moon. Some of the technology forecasting was successful in creating products that have only recently become reality: for example, holograms, LCD screens, and electronic projectors.

- *The Day the Earth Stood Still*. (Wise, R. (director). 1951).

A flying saucer lands in Washington; an alien steps out and demands that the human race stops its violent behaviour. To persuade Earth that the alien visitors mean business, they disable every electrical appliance on the planet (hence the title). It transpires that the huge robot who accompanies the alien is not the servant (as humans would expect) but the master, who will ensure that humans accede to this demand. In terms of this study the design issues are minimal, but the movie is of interest owing to its reflection of post-war concerns about invasion and weapons of mass-destruction.

- *Invasion of the Body Snatchers*. (Siegel, D. (director). 1955).

The residents of a small American town are gradually replaced by alien replicas of themselves – replicas who are stripped of all emotions. Like *The Day the Earth Stood Still*, *Invasion of the Body Snatchers* has little design content of interest to this study, but the contemporary issue reflected in this movie is the cold-war paranoia inspired by communism. Owing to its deft handling of these themes, *Invasion of the Body Snatchers* is regarded as one of the best of the 1950's Hollywood science fiction movies (Clute & Nicholls, pg. 625).

- *2001: A Space Odyssey*. (Kubrick, S. (director). 1968).

2001: A Space Odyssey was the result of a collaboration between respected science fiction author Arthur C. Clarke and director Stanley Kubrick. Kubrick's intention was to make "the proverbial good science fiction movie" (Clarke, C. 1999, pg 259) and the critical opinion was that he succeeded. The resulting movie is enigmatic and challenging, and remains one of the most influential science fiction movies to date owing to both the quality of the story and the quality of the movie making. Based on a short story by Clarke, the *Odyssey* of the title is a trip to Jupiter instigated by the discovery of an alien artefact buried on the Moon in such a way that it must have been intended to be uncovered by human exploration. *2001: A Space Odyssey* is often described as a cold and inhuman movie in the way that it subsumes the human elements in its visual and technical grandeur. Given the strong air of reality, the technology apparent in the movie is a mostly a carefully considered and realistic extrapolation of what was considered achievable 39 years into the future. However, in the

pursuit of reality not only do the spaceships look like something that NASA might have produced but - in contrast to virtually every other space-bound science fiction movie ever made - they don't make any sound in space.

- *Star Wars*. (Lucas, G. (director). 1977).

Star Wars and the five subsequent movies (2 sequels, 3 'prequels') all feature on the highest-grossing movie list (see Table 2, pg 108). The story follows Luke Skywalker as he treads the classic path of the monomyth (see 4.1.2 Glossary): raised by his uncle and aunt who are killed by the evil forces of the Empire, Luke travels the galaxy with his mentor Obi-Wan Kenobi, eventually accepting the mantle of responsibility of the mystical energy the Force and using it to overcome the Empire's deadly planet-killing Death Star. Director and screenplay writer George Lucas has frequently acknowledged a wide range of influences on *Star Wars*, including westerns and the writings of Joseph Campbell. The production design and special effects were state of the art for 1977, and the movie is full of science fiction icons that have permeated the culture: the robots C3PO and R2D2, light-sabres, the Force, Storm Troopers, the Millennium Falcon spacecraft that Luke travels in, the villain Darth Vader, the (other) mentor Yoda, and so on. The movie was subsequently renamed *Star Wars Episode 4: A New Hope* when the 3 prequels were announced.

- *Blade Runner*. (Scott, R. (director). 1982).

Like *Metropolis*, the dystopian future in Ridley Scott's *Blade Runner* is bleak and gritty, but has a richness and depth that is more easily recognisable from a contemporary viewpoint as a possible future than most science fiction movies. Based largely on the novel *Do Androids Dream of Electric Sheep* by cult science fiction writer Philip K Dick, the movie explores a melange of issues about humanity, exploitation and society. The title is a relatively meaningless job description for the main character, who is ordered to hunt down and kill a number of 'replicants' (human clones) who have escaped from custody. *Blade Runner* received a very mixed reception on initial release and was strongly criticised for its lack of humanity, but went on to become a cult success. The production design of *Blade Runner* is discussed at several points in this thesis.

- *Minority Report*. (Spielberg, S. (director). 2001).

Minority Report is the first 'adult' science fiction movie from the director of *ET: The Extraterrestrial* (1982) and *Close Encounters of the Third Kind* (1982). Based on the novel of the same name by Philip K. Dick (as many of the more successful science fiction movies have been), the movie investigates the ideas of fate and choice by proposing that people who can foresee the future could be used to prevent serious crimes. Spielberg layers in a considerable amount of design content – which is peripheral to the bare bones of the story, but a key element of the movie. The depth and breadth of the design vision is beguiling, and the ideas that Spielberg insinuates into the movie include an urban transport system that climbs up and down the architecture, and an office workstation for the virtual manipulation of information. The workstation is likely to become one of science fiction cinema's iconic products. The most interesting aspect of the design content is the tension between the celebration of the special effects and the technology in the *mis en scene*, and the interrogation of the technological idea of foreseeing the future.

- *Brazil*. (Gilliam, T. (director). 1985).

Brazil is a dark, satirical black comedy, with the dense production design content playing as much a role in the narrative as the plot. The story is set in a dystopian near future, where fashion and some of the technology is at times Victorian and at other times raw and futuristic. The imagery is of vast, inhospitable, dank buildings and spaces, where the romantic hero chases his paramour through an equally impersonal bureaucracy – ultimately being tortured in retaliation for his romantic leanings. *Brazil* is not a cheerful movie, and the dark, gloomy, misty city in which the hero lives and struggles is the perfect background to highlight the difficulty of an individual struggling against 'the machine'.

- *The Fifth Element*. (Besson, L. (director). 1995).

The Fifth Element is a loud and raucous movie, with a simple plot but a rich, colourful and mildly satirical production design content that matches the mood of the movie. The movie is set in 2300, and involves a fantasy plot that culminates in the Fifth Element – love (after the first four elements, earth, air,

fire and water) – saving the Earth from destruction by a malign, mobile planet. The narrative is secondary to the visuals: with costumes designed by French fashion icon Jean-Paul Gautier, and the production design based on the work of the French graphic novelist Moebius, the design is innovative in overall feel but leans heavily on interpretations of recognisable icons such as vehicles, weapons, and communication products.

- *K-Pax*. (Softley, I. (director). 2001).

K-Pax is the name of the planet from which the main character Prot claims to have travelled to Earth. The movie, however, is more the story of the psychologist who is assigned to Prot when he is arrested for vagrancy after possibly appearing in a beam of light in the middle of a busy railway station. The story follows the psychologist as he attempts to cure Prot of his delusion – and then starts to question if Prot is really ill or if he might be an alien from K-Pax after all. Whether Prot really is an alien is ambiguous and is not answered by the narrative. Set on the Earth of here and now, there is no fantastic or futuristic design content at all and the very familiarity of the sets underscores the gently disquieting feel of the movie.

Television

- *Star Trek*. (Roddenberry, G. (Creator). 1966 – 69).

The genesis of the *Star Trek* phenomenon was in three series of the original television programme aired in the late 1960's. The television series has spawned several other television series set in the same universe, 10 movies, and many novels and graphic novels. The bare bones of the stories relate to the explorations of the starship *U.S.S. Enterprise* as the mostly human crew 'boldly go where no man has gone before'. Many of the original episodes were written by well-known science fiction authors, and the series has at times displayed excellent science fiction ideas. The impact of the original and subsequent television series in terms of fan culture has been substantial.



Chapter 1: Introduction

1.1 Inspiration



Figure 1.1
Designing and building a spaceship:
a dream job for an industrial
designer?
Eaves & Dillard, 1998. p.127 UPX Ultimate Pix, <http://upx.primenova.com/2/index.html>

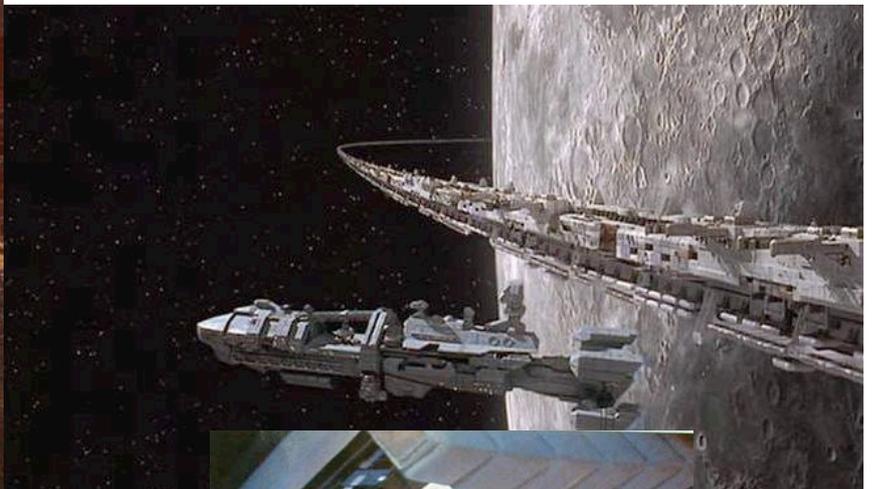


Figure 1.2
The technology of the future:
What will designers be able to achieve?



Figure 1.3
The world of the future: how can
industrial design make our world a better
place? *Kino International,*
<http://www.kino.com/metropolis>



Figure 1.4
How will my design decisions contribute to the
texture of the future?
Bizony, 1994. p. 51

1.2 Introduction to the chapter

The chapter describes why, in the first instance, industrial design and science fiction were connected, and explains the relevance of the study. It is partly written from a first person perspective, as the origin of the study has deeply personal roots. It also aims to connect the personal nature of the original questions that initiated the study with my views about why the study is of importance to designers. This is a key issue that affects the selection of the research and analytical methods, processes, presentation and the language used in the thesis.

The hypothesis is laid out at the start of the chapter. The title of the study is explained, and after the personal statement, there is a discussion of the development of the study and the key issues behind the literature review. The study questions are stated and related to the areas of industrial design, science fiction, and science fiction cinema. Several issues that underpin the analysis of industrial design and science fiction are identified, and the chapter concludes by mapping out the overall structure of the thesis.

1.3 Hypothesis

There are four aspects to the hypothesis. This study proposes that:

1. The roles of industrial design and science fiction are based on parallel ideas.
2. Industrial design is suffused with, and sympathetic to, science fiction thinking.
3. There is a cause and effect relationship between aspects of industrial design and science fiction. Science fiction cinema is a key element in the cause and effect relationship.
4. Science fiction cinema performs a key function in the role of science fiction, and can be employed to explore and discuss the roles of industrial design and science fiction.

Roles and parallel ideas

This study proposes that the role of industrial design is *mediation*, and that *responsibility* is a critical element of this role.

- Industrial design *mediates* the relationship between people and technology. 'People' includes users, manufacturers, designers and society. Mediation becomes more important as complex product technologies question the traditional visual language that products use to communicate their operation and function to users.
- The idea of *responsibility* is focussed on the potential impacts of design decisions for everyone involved in the lifecycle of a product. Responsibility becomes more important as products increase in complexity and as environmental resources are threatened.

This study highlights two related ideas that shape the role of science fiction: *anticipation* and *interrogation*. These concepts are based on themes already understood in science fiction, but the terms themselves are proposed by this study. The terms *anticipation* and *interrogation* better relate to the themes under investigation.

- The initial impression of science fiction is that it attempts to predict the future. A review of the evidence concludes that science fiction as a genre is more interested in *anticipating* the *variety* of possible futures.
- Science fiction *interrogates* these possible futures to question their appropriateness. The results of this interrogation should direct decisions that are being made today.

Science fiction thinking

This study proposes to test the hypothesis that science fiction thinking is woven through industrial design thinking, and that science fiction is difficult to distinguish from design itself in two key areas: context and processes (forecasting, scenarios). In these areas, industrial design and science fiction do many of the same things for many of the same reasons.

Cause and effect

The hypothesis suggests that industrial design is influenced by science fiction, and vice versa. Cause and effect is apparent in the culture in which industrial

design and science fiction exist, as well as the ways that both areas operate. It is further suggested that science fiction cinema is another element of cause and effect.

Industrial design and science fiction cinema

Lastly, the hypothesis proposes that the industrial design content of science fiction movies can be analysed and structured so that the impact of design decisions on the movie are visible, and the parallel nature of the roles of both areas is demonstrated. The complexity of the scenarios played out through science fiction narratives in science fiction cinema provides opportunities to assess the impact of design decisions that are difficult to access any other way.

1.4 The relevance of the study

It is my view that the study is relevant to industrial design at three points.

Firstly, this study suggests that industrial design already uses science fiction thinking. This thinking is evident at many points within industrial design practice where designers employ forecasting to direct design decisions. The predictive processes used in these projects parallel those used by science fiction.

Science fiction has already explored the future in some depth and scope, and this significant body of work represents many ideas about what the future will be like, and how we might get there. Designers can learn many lessons from science fiction's forecasting and processes. This is one point at which science fiction processes can contribute to industrial design.

Secondly, forecasting goes hand-in-hand with interrogation – questioning not just whether something *can* be done but whether it *should* be done. These interrogation processes lie more in the realm of science fiction, which took the ‘not can we do this, but should we do this?’ attitude to heart much earlier than industrial design (and is still some way ahead). In its infancy as a profession, industrial design established a role within commerce based on the very

pragmatic concern of profitability. Innovation in industrial design was largely driven by the need to design commercially successful products. This relatively unquestioning, narrow-focus, 'can we' attitude to the role that industrial design plays in commerce, culture and environment needs to be replaced by a broader, 'should we' attitude that considers the breadth of responsibility that industrial design has for the state of our future. Both the interrogative and anticipatory aspects of science fiction have much to offer industrial design in the understanding the consequences of decisions that we make today. This is the second point at which science fiction can contribute to industrial design.

Thirdly, this study suggests that science fiction may be inspirational for industrial designers at a very practical level. Industrial designers may value speculative design projects (ranging from provocative car designs to design for science fiction cinema) as they remind us, despite the nitty-gritty of day-to-day commercial reality, with its restrictions, distractions and irrelevancies, why we are here: to make the world a better place.



Figure 1.5
Norman Bel Geddes: provocative
and inspirational designer.
Politecnico di Torino
<http://www2.polito.it/strutture/cisda/HypArc/resolution/nbgritr.jpg>

1.5 *Why is the study titled 'Beyond the Wall'?*

He told me once that he needed a blank wall opposite his desk. It represented the unknown, the untried, the realm he loved most to stare into. It was his crystal ball. Such an imagination demanded boundless courage. He had the audacity to step through that blank wall into worlds where no one has dreamt of setting foot. And he had no fear that people would scoff, though many people did. (Flincham, 1997. p. 130)

The title of the study is based on this quote from Henry Dreyfuss – one of the pioneering American industrial designers during the middle of the twentieth century. Dreyfuss was talking about the designer Norman Bel Geddes, with whom Dreyfuss had worked prior to setting up his own consultancy.

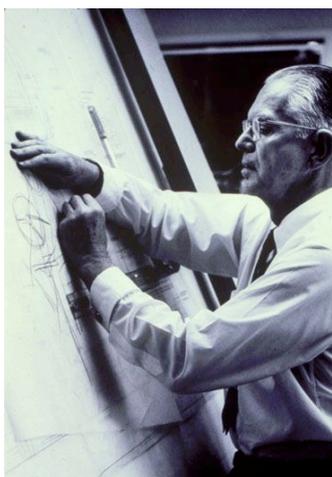


Figure 1.6
Henry Dreyfuss: a designer who
wanted to make a difference.
Dreyfuss, 1955. p. 242

The language that Dreyfuss is using could easily be describing science fiction. *The unknown, the untried, worlds where no one has dreamt of setting foot* – these are words and ideas that industrial design and science fiction have in common. Both industrial design and science fiction aspire to be ‘beyond the wall’, although the reality of commercial practice keeps the vast majority of industrial designers anchored with at least one if not both feet on the ‘real’ side.

Both Dreyfuss and Bel Geddes are central figures to this study. Dreyfuss’s approach to industrial design is based around the idea of ‘making a difference’, and he was the designer who took the science of ergonomics and translated it into a technology that could be understood by the design profession.

Coincidentally or not, Bel Geddes himself is also an important figure in this study for his inspirational and provocative design work and his contributions to the Streamlining movement. History connects Bel Geddes with the negative aspects of Streamlining (the promotion of consumption, and use of superfluous streamlining imagery on stationary products) although Bel Geddes’ later writings show that he was less than enthusiastic about how streamlined forms were applied in this way (Bel Geddes, in Gorman, 2003).

What’s beyond that wall? What does the wall represent? What is the relevance of the wall to design? Dreyfuss’ observations about Bel Geddes capture, at several levels, the essence and intent of this study.

1.6 Why am I undertaking this study?

1.6.1 Personal Statement

My father once said that I’d only be interested in women if they came supplied with an instruction book.

In hindsight, I was always going to become an industrial designer. Reflecting on my childhood and upbringing, I can see a constant thread of interest in



Figure 1.7
Gerry Anderson's *Thunderbirds*:
fantastic machines, strings most
definitely attached (Anderson &
Anderson, 1966). *Michael Snoeks*
homepage
[http://www.algonet.se/~tourtell/images/
thunderbirds/Thunderbird2open.jpg](http://www.algonet.se/~tourtell/images/thunderbirds/Thunderbird2open.jpg)



Figure 1.8
Stanley Kubrick's *2001: A Space*
Odyssey: inspirational science
fiction cinema (1968).
Bizony, 1994. p. 123

making things, model making, mechanisms and problem solving, as well as a consistent interest in products and technology (all the stereotypical interests of the industrial designer) with an interest in arts and drawing stitching it all together. These interests eventually led me to industrial design and the rest, as they say, is history. (It's this aspect of his son that my father was commenting on; and, by the way, he wasn't *entirely* right.)

On the other hand, my interest in science fiction is a relative newcomer: I've been reading science fiction on and off since I was 12, pretty steadily since I was 16. I would describe myself as an enthusiast rather than a hardcore science fiction fan; it's not my life, I'm not obsessed with it, and I don't indulge in any of the more extreme science fiction fan activities (you'll never see me dressed up in a *Star Trek* costume, except as a joke). But science fiction does inspire me. In it, I see possibilities and promise, challenge and change, the excitement of technology and the lessons about misuse.

Somewhere in the middle of these two things is an interest in movies, which was loosely sparked by Gerry Anderson's 1965-66 television series *Thunderbirds* as a child, and focussed more tightly in my mid-teens by movies like *Dog Day Afternoon* (dir. Lumet, 1975) and (critically) Stanley Kubrick's *2001: A Space Odyssey* (1968). As a reader of science fiction and a movie fan, it was almost inevitable that I'd focus on science fiction movies.

From a viewpoint somewhat later in life, I can see how my interests in industrial design and science fiction have fed on each other; not necessarily explicitly or in a parasitic sense, but in a symbiotic, almost subterranean sense. My interest in technology and its applications has been enriched by my interest in both science fiction and industrial design, and vice versa. Since my early days as a student, my interest in industrial design has tended towards those ideas and products that I see as making a difference. I find myself less interested in designing disposable products or those products built around transient ideas, and more interested in projects that will make a genuine difference to someone's quality of life. This interest in what I would loosely term 'human-centred design' matches my interest in dilemmas and consequences as played out in science fiction narratives.

The two aspects of science fiction I enjoy most are novels and movies, which in many ways supplement each other as ways of exploring science fiction things. The written word can be rich in detail or highly evocative, detailed or amorphous, can pause to tease out an idea or rush through leaving the reader breathless. Science fiction is a literature of ideas, and the written word is the ideal vehicle to express and explore ideas. Ideas can also be explored in movies, but the visual nature of movies brings the opportunity to enrich the science fiction experience with a level of definition of form, space, movement, and function that is impractical on the page. The depth of the visual world portrayed in science fiction cinema is something that as an industrial designer I find beguiling. Implicit in much science fiction cinema is a thought-provoking conflict between the warnings about the misuse of technology and the way that technology is used to bring these warnings to the screen through special effects.

These are rich issues on which to build a study that is of relevance to me as an industrial designer.

1.6.2 Chance Discussion

What really started this study off was a discussion with another industrial designer with whom I shared an office through the second half of the 1990's, and who also shared my interest in science fiction. In the course of this particular conversation, my colleague noted that probably three-quarters of his graduating class of 18 industrial design students read science fiction. As the stereotype of science fiction is that of a marginalised genre that appeals to a minority of technogeeks, it would seem unusual for this proportion of industrial designers to be interested in science fiction.

1.6.3 Reflection

This observation sparked lively discussions with other designers and with science fiction enthusiasts. One result of these discussions was the confirmation that my colleague's observations about his graduating class were not an anomaly – there are many industrial designers who are interested in

science fiction. A second result was the conscious reflection about what interested me about both science fiction and industrial design, and – of real interest – what they mean to me. This raised a plethora of questions. Is there a relationship between industrial design and science fiction, and if so, what is it and what does it mean? Does industrial design influence science fiction? More interestingly, does science fiction influence industrial design? The contribution of industrial design to science fiction is readily apparent in science fiction cinema, but does science fiction contribute anything else to industrial design?

One of the areas I kept coming back to was science fiction cinema, as many science fiction movies lean heavily on their production design content. Slowly the realisation dawned that a vast amount of industrial design work is done for movies, and that for many productions the design content is not only a critical part of the *mis en scene*,¹ but is a significant part of the narrative. More questions were sparked by the realisation that science fiction movies are the most visible form of science fiction, and that the industrial design in these movies is an inevitable part of this visibility. Does the design content of science fiction movies affect industrial design or industrial designers? If so, why? What does it mean? What can be learnt about the future of design from what happens in science fiction movies? What can be learnt about industrial design from the design processes used in designing for science fiction movies?

What fascinated me at the start of this endeavour, and continues to fascinate me, was the possibility that the design projects done for science fiction movies might be the sort of work that every industrial designer secretly wants to do. While constraints might be created by the budget of the movie or special effects technology, the actual design of the products is only constrained by the narrative or the 'world' of the movie. Production processes don't have to be considered, and there's no injection moulder or marketing manager saying 'that won't work!' at inopportune moments. Half of the products can be thrown together using spray paint, filler and junk from the skip out the back and the only requirement is that it looks cool in operation and makes sense with everything else around it. The other half of the products can be generated

¹ *Mis en scene – the world inside the movie*

digitally and will never even get close to anything like an injection-moulding machine.

Rather than being restricted by real-world production technologies, you can invent your own. Product technologies can be invented just because they *look* exciting. Technologies and products can be invented just because they *sound* exciting. Every product that is designed 'makes a difference'. How tempting is that for a design project?

1.7 How did the study unfold?

This study has progressed in a loop; well, perhaps more of a spiral.

The conversation mentioned earlier, the one that started it all off, occurred some time in 1998. When in early 2000 I was searching for a topic for a possible Master of Design proposal, investigating the industrial design aspects of science fiction movies was one of the six topics on my shortlist. I produced a proposal for an MDes at Massey University in mid-2000.

The focus of this proposal was the industrial design content of science fiction cinema. Part of my proposal critiqued the design content of a series of movies selected on a chronological basis, and considered two aspects of 'context'. The first issue was the connection between design in the real world at the time the movie was produced and the design of the internal world of the movie. The second issue was the concept I termed 'framework', which I consider as the larger context of the fictional world of a specific movie: the network of decisions that form the 'world', and what good design means within this framework.

When I actually got my teeth into the literature review in early 2001, I discovered little useful discussion or analysis of either the industrial design content of science fiction movies, or much recognition of a relationship between science fiction and industrial design. By 'useful', I mean of specific interest to industrial designers, or of direct relevance to my study. As this did

not align with my observations discussed in the previous section, I was left with two conclusions: either that the connection between industrial design and science fiction was so obvious or so shallow that it wasn't worth investigating, or that I was in fresh territory. Not coincidentally, 2001 was my first year teaching industrial design at Massey University (having previously taught other design disciplines as well as practising professionally), and informal discussions with industrial design students confirmed a strong thread of interest in science fiction and science fiction movies. The vast majority of investigation that I have done around the topic, therefore, has been to test the validity of the basic premises identified in the hypothesis rather than analysing a body of existing work.

However, I continued to explore my interest in science fiction cinema, and my initial ideas about the interrogation of industrial design content was supplemented by my development of the concept of 'leakage'. This is a term that describes the unintentional appearance of contemporary design in a science fiction movie that was intended to represent the future; representing cutting edge contemporary design as the design of the future. I wrote a 40-page discussion of industrial design in science fiction cinema, which encapsulated my thoughts on production design and its development, and included these and other original concepts. Two Massey University School of Design staff reviewed this work, and their feedback suggested that the topic was far too broad, and lacked both focus and serious analysis.

While I was mulling over these issues, a number of parallels between science fiction and industrial design became apparent. Not only is there a substantial design presence in science fiction, there is an equally strong (if less visible) science fiction presence in industrial design. It was through this realisation that I started considering just what science fiction might have to offer industrial design. This question was initially focussed on what industrial design might learn from how the profession contributes to science fiction cinema (the leakage concept was part of this) but the investigation became much deeper as I considered the ways that both science fiction and industrial design work.

At this stage, the focus of the study had broadened rather than narrowed, and the topic had moved from the industrial design content of science fiction cinema to investigating and describing the relationship between industrial design and science fiction. Out of this period of investigation emerged a need to understand the real nature of industrial design and science fiction and why they exist in the first instance. The aim was to explore the scope and depth of these two areas to identify parallels, overlaps or convergences to guide the development of a theory that describes and analyses the relationship between industrial design and science fiction.

Around this time (early 2003) a new supervisor was appointed for my study. One of my new supervisor's first suggestions was that I attempt to diagram the issues in my study. This proved to be a pivotal point in the progress of the study, as the depth of understanding of science fiction and industrial design and the relationship between the two generated a clear, concise visual representation. This cyclical model was central to the identification of a cause and effect layer to the industrial design/science fiction relationship.

A second landmark in this study was the discovery of a quote from Will McCarthy's *Lab Notes* column on the *Science Fiction Weekly* website (www.scifi.com/sfw). In an article titled 'The Future: Treacherous When Shallow', McCarthy identified what he termed the 'job' of science fiction – an approach to the genre that sidestepped any argument about definitions and the scope of science fiction (a notoriously difficult area) and skipped straight to *why* it is that science fiction exists in the first place (McCarthy, 2003). When a similar description of industrial design by academic Brian Lawson was identified, the connections between the two areas solidified and took a very interesting shape (Lawson, 1997).

Taken together, these two developments were critical to the development of the study, and were key elements in the emergence of a theory from which the study could proceed.

The remainder of the study has seen the development and tuning of the hypothesis, and the broadening of the literature review to add depth and detail

to the study. During the middle phase of the study, investigating science fiction cinema took a back seat to the need to understand some of the fundamental issues in industrial design and science fiction. In the final stages of the study, it became apparent that science fiction cinema is a key link between industrial design and science fiction. The topic has reappeared in the study as one of a number of case studies that demonstrate the operation of the industrial design/science fiction relationship. The topic, therefore, has almost turned full circle, but has gained both depth and scope in the process. Perhaps this is more of a spiral than a circle – the same issues are being investigated, but in much greater depth, and the connections between the two areas are much more apparent.

1.8 Study Questions

Five central questions form the first layer of inquiry. They address the first proposition in the hypothesis: that *the roles of industrial design and science fiction are based on parallel ideas*.

1. What is industrial design?
2. What is the role of industrial design?
3. What is science fiction?
4. What is the role of science fiction?
5. What is the nature of the connection between industrial design and science fiction?

Figure 1.9
The relationship between the central study questions and the two study areas.

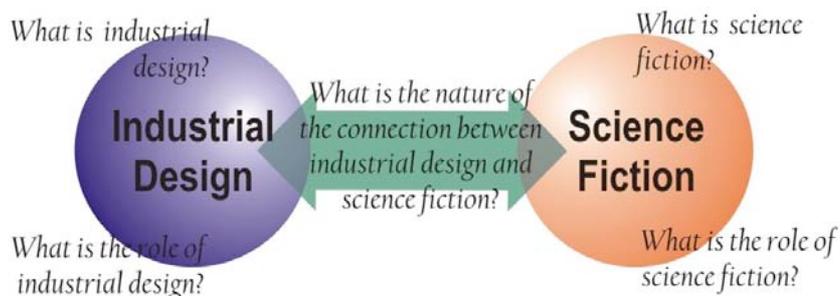


Figure 1.9 shows the five central study questions and their relationship to the primary research areas of industrial design and science fiction.

The second layer of investigation is built around eight supplementary questions:

1. *Industrial design is suffused with, and sympathetic to, science fiction thinking:*
 - a. What can industrial design learn from science fiction?
 - b. Are science fiction processes and ideas of relevance to industrial design projects?
2. *There is a cause and effect relationship between aspects of industrial design and science fiction. Science fiction cinema is a key element in the cause and effect relationship.*
 - c. What impact does industrial design have on science fiction?
 - d. What impact does science fiction have on industrial design?
 - e. Why are industrial designers interested in science fiction?
 - f. Are industrial designers interested in the design content of science fiction movies?

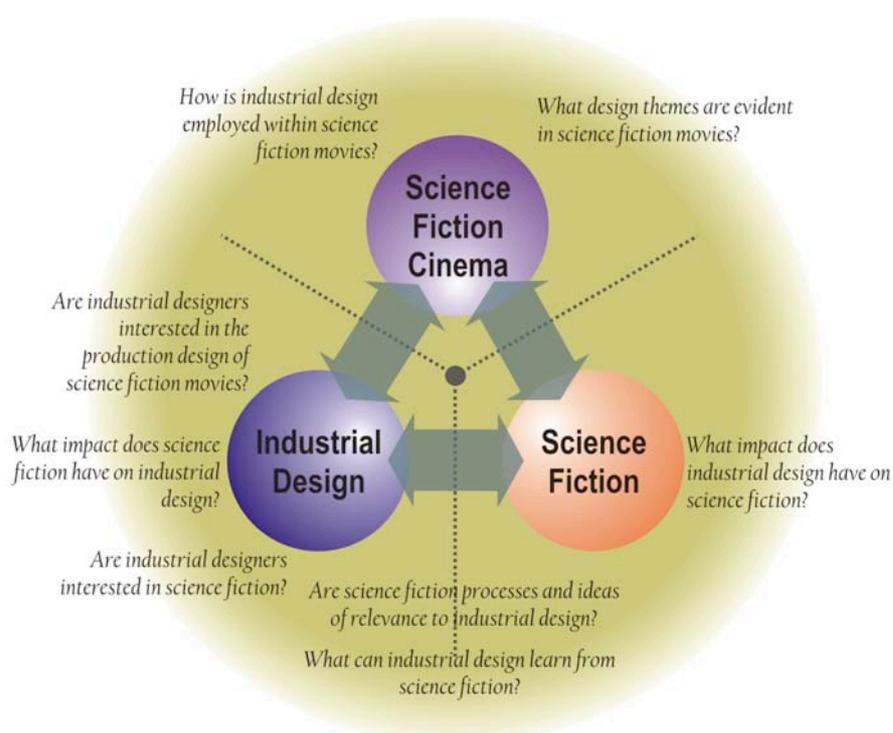


Figure 1.10
The relationship between the supplementary study questions and the three areas

3. *Science fiction cinema performs a key function in the role of science fiction, and can be employed to explore and discuss the roles of industrial design and science fiction.*
 - g. What design themes are evident in science fiction cinema?
 - h. How is industrial design employed within science fiction movies?

Figure 1.10 shows the eight supplementary questions and how they relate to industrial design, science fiction, and science fiction cinema. It can be seen that the majority of questions relate to industrial design, which fits with the intent of the study.

1.9 Global issues that underlie the study

1.9.1 Industrial design as a filter

It should be taken for granted that what is discussed throughout this study is seen through the eyes of an industrial designer. While there is discussion about what science fiction is, for example, or what science fiction cinema is, the overall direction is one of exploring issues that are of interest and relevance to the industrial design profession. This filter is applied to the selection of research methods and analytical tools, as well as the presentation of the outcomes of the study.

1.9.2 Directions for research

As noted in Section 1.7, the initial explorations into the relationship between science fiction and industrial design revealed an almost complete absence of meaningful discussion of this area. With no body of previous work to lean on and review, the literature review was approached from a broader view that investigated both science fiction and industrial design in some depth. This is reflected in the study questions in the previous section. The enriched understanding of each area supported the analysis and enabled relevant conclusions to be drawn.

The investigation and analysis of science fiction cinema is still an important aspect of this study. While the analysis of movies and cinema in general has been approached from a number of directions (film studies, cultural theory, feminism, queer theory, special effect processes) there is little discussion of the design aspects of science fiction cinema other than at a film-specific level. To do so required the development of concepts that relate specifically to the design aspects of science fiction cinema.

1.9.3 Key study issues

An approach to the discussion of some issues in this thesis is the exploration of the interplay between *perception* and *intention*.

- The *perception* approach explores how the viewer or reader *perceives* these issues rather than how they are intended to be seen by their creators, designers, artists, authors or directors. This drifts close to the process of 'reading' that is evident in areas such as film studies and cultural theory, but equally crosses into industrial design's interests in semiotics and semantics.
- The *intention* approach explores deliberate, consciously created meanings layered into the product or media.

The differences between 'intention' and 'perception' apply at a number of levels right through industrial design and science fiction, but are particularly relevant in the history, development, and aspects of the products of both areas.

Another key idea in this study is that of 'impression' and 'sensation', which is related to 'intention' and 'perception'. The concept is particularly relevant to the visual aspects of science fiction cinema, although the approach has applications in other areas of the study.

- Some movies give the *impression* of science fiction (they have the trappings and icons of science fiction) but do not use science fiction ideas: the narrative is a reimagining of a familiar story.
- Other productions give the *sensation* of science fiction; the science fiction ideas permeate the narrative, even if they do not give the impression of

being science fiction and lack the obvious imagery (spaceships or rayguns, for example).

Impression / sensation applies to industrial design, but in a slightly different area that relates to the visual language the designer manipulates as a tool to communicate the intent, function and use of a product. This is termed "*product semantics*" (Press & Cooper, 2003, p. 138).

A minor theme in this thesis is a non-reliance on definitions. A curious parallel between science fiction and industrial design is that there is much debate about what these areas are. Definitions tend to describe the view from within the area, and one of the things that can be learnt from definitions is how these areas want to be viewed and what they want to be seen doing. While definitions of industrial design and science fiction are valuable, they can equally sideline discussion into focussing on the relative merits of different definitions, which has no effect on the field at all.

By contrast, the view from the outside the area is often encapsulated in stereotypes. The recognition and discussion of stereotypes is a useful tool; most stereotypes have some basis in reality, but they may fail to reflect how the subject has developed and matured. Both science fiction and industrial design exhibit characteristics that connect clearly with their stereotypes, but have developed significantly in both depth and scope. Equally, any analysis of these areas requires that external and internal views are balanced and weighed, so that some real understanding of science fiction and industrial design can be arrived at.

1.10 Structure

After this introduction, *Chapter 2: Research Methods* encompasses the overall approach that I have taken to the study and to structuring and analysing information. It introduces the issues behind the literature review, and describes why case studies were chosen as a key method for exploring the topic. The

literature review is broken into four sections that appear at the beginning of their respective chapters rather than in the Research Methods chapter.

Chapter 3: Industrial Design and *Chapter 4: Science Fiction* start by describing and analysing their respective areas, and then explore issues that arise from that analysis. They are structured the same way and discuss similar things, and both chapters identify common themes and global issues. It could be argued that using a parallel structure for these chapters forces the analysis in a direction that may not suit one or other area, but the structure of these chapters is logical, as the same questions were asked about each area.

Chapter 5: Industrial Design and Science Fiction explicitly compares and connects the two areas using the issues identified in the earlier chapters on industrial design and science fiction. The analysis in this chapter is the core of the study: it maps out the relationship between the two areas at several levels, and explores the implications of the relationship to both areas. Through this chapter the analysis of the relationship between industrial design and science fiction is condensed into a graphic model, which is built up as the chapter progresses.

Chapter 6: Case Studies uses three case studies to explore the subtleties of the industrial design / science fiction relationship. The case studies test the four ideas in the hypothesis: the role of both arenas, science fiction thinking in industrial design, cause and effect, and design issues in science fiction cinema.

Chapter 7: Conclusions summarises the findings of the study, and highlights a number of areas for further study.

1.11 Summary

The hypothesis suggests that the relationship between science fiction and industrial design can be of use to the design profession at a number of levels, and this study has the potential to add to the tools available to the industrial

design profession. However, the impetus for this study was a combination of personal interests and chance observations.

Given the lack of a theory to describe the industrial design/science fiction area, a significant amount of original work is required to extract the required level of understanding from the literature review. All the discussion in this thesis will be filtered through an understanding of industrial design. This also applies to the selection of research methods and analytical tools.

The study has ended up where it was originally intended to be, but has seen a significant broadening of focus in order to understand the areas of science fiction and industrial design in enough depth that meaningful conclusions can be drawn. The supplementary research questions will be used to help address the primary questions.

The 'industrial design' and 'science fiction' chapters of the thesis are structured in parallel so that the discussion of the relationship between them is clear. The understanding of the two areas will be drawn together in a separate chapter.



Chapter 2: Research Methods

2.1 Introduction to the chapter

This chapter aims to identify the overall approach and the detailed methods that were used to gather and analyse information for the study. The chapter describes why these research methods were selected, and argues for the selection of methods that make the study relevant and interesting to industrial designers. It also addresses the relationship between the study questions and selection of research methods, and discusses the ethics issues in the study.

The chapter also discusses the literature review. The three broad areas of research are discussed, and the type of information extracted from each area is noted. As noted in Section 1.7, the most important single issue to emerge from the literature review is that there is little work that discusses any connection between industrial design and science fiction, and none were found that discusses it in any depth. This defined the form of the study.

The remainder of the chapter discusses the selection of appropriate analytical tools for mapping the scope of the industrial design / science fiction relationship, and explains why case studies were chosen as an appropriate method for examining the hypothesis.

2.2 Research Method Selection

2.2.1 Opportunities

There are many opportunities for exploring the implications of the relationship between industrial design and science fiction. One possibility would be to employ design-based research methods to query what effect science fiction has on industrial designers, and how science fiction could be used to inspire both individuals and projects. Another possibility would be to investigate the

role that science fiction has played in the development of individual designers; for example, exploring the impact of science fiction literature, toys, movies or television programmes on the attitudes of emerging industrial designers. A third possibility would be a quantitative study that focuses purely on the number of industrial designers who respond to science fiction ideas and processes.

However, given the lack of an existing theory for this area, the study must establish:

- *If there is* any relationship between industrial design and science fiction;
- If so, *what* it means, and;
- *Why* this is occurring.

2.2.2 Study Questions and Research Methods

The type of information sought by the questions established in Section 1.8 limits the choice of methods to those that can be demonstrated to deliver that information.

Questions 1-5 are looking for themes, ideas and connections, and are primarily interested in qualitative information. These questions will be addressed in Chapter 3: Industrial Design, Chapter 4: Science Fiction and Chapter 5: Industrial Design and Science Fiction, using secondary information sourced through the literature review, as well as analytical tools described later in this chapter.

The supplementary questions have been more difficult to answer using strictly secondary sources, as very little material was identified through the literature review. These questions therefore need to be addressed by applying analytical tools to the literature review, and through primary research.

These supplementary questions are addressed in Chapters 3 to 6.

Of the eight supplementary questions, only one (f) is looking for essentially yes / no answers, which lead to quantitative methods. The remaining seven

questions (a, b, c, d, e, g, h) are seeking 'why' and 'how' information, which would lead to qualitative methods.

This supports the basic premise of the study, which is working from observations of existing phenomena and trying to understand their meaning. In *Starting Fieldwork: An Introduction to Qualitative Research in New Zealand*, Tolich and Davidson (1999) state that:

Inductive logic... has a different starting point. It may begin with a strong personal interest in some topic such as a holiday in Queenstown that left you with an overwhelming urge to understand what makes people want to bungee jump. Or it may be that there is no formal theory on a particular topic about which you want to understand more. Inductive logic research allows you to do these things because it moves the researcher from data collection to the developing of formal theory. (Tolich and Davidson, 1999. p. 32)

This is exactly the situation that instigated this study: observations suggested the existence of a relationship between science fiction and industrial design, requiring a generalist/overview approach to describing that relationship and then a move to proposing a theory. As this is the first study in this area, breadth of understanding is an appropriate aim.

Tolich and Davidson also state in *Social Science Research in New Zealand*,

In inductive research, the researcher moves from the observations, through generalisation, to theory generation. (Tolich and Davidson, 1999a. p.18)

Quantitative research is usually deductive, and qualitative research inductive. (Tolich and Davidson, 1999a. p.19)

This confirms that the research methods should be qualitative rather than quantitative. Qualitative information shows *why* the phenomena are occurring, and any shows how widespread the phenomena are. This study uses both

Study question	Qualitative		Quantitative	
	Primary	Secondary	Primary	Secondary
What can industrial design learn from science fiction?	Case studies	Case studies		
Are science fiction processes and ideas of relevance to industrial design projects?	Case study: Semi-structured interview	Literature review		
What impact does industrial design have on science fiction?	Case study: Semi-structured interview	Literature review Case studies Text analysis		
What impact does science fiction have on industrial design?		Literature review Case studies Text analysis		
Why are industrial designers interested in science fiction?	Online discussion analysis Semi-structured interview	Literature review		
Are industrial designers interested in the design content of science fiction movies?				Online discussion analysis
What design themes are evident in science fiction movies?	Text analysis: Taxonomy, Case studies			
How is industrial design employed within science fiction movies?	Text analysis: Taxonomy, Case studies			

Table 1
Relationship between supplementary study questions and primary / secondary sources.

quantitative and qualitative methods, but as it is heavily biased towards discovering why the phenomena are occurring, qualitative methods predominate.

Table 1 shows how the supplementary study questions are addressed through qualitative/quantitative and primary/secondary research methods.

The discussion of the relationship between the two areas of industrial design and science fiction in Chapter 5 is based on the literature review, but is also informed by diagrammatical analysis of the material. The case studies in Chapter 6 also use qualitative and quantitative analysis of an online discussion, and of a structured interview carried out by email.

2.2.3 Design Research

For the study to be both of interest and of use to industrial design, the research methods should produce and present information in a way that is relevant to industrial design.

In professional design practice, a range of methods has been developed specifically to generate information of use to industrial designers and design projects. In *Design Research: Methods and Perspectives*, Brenda Laurel (Laurel, (Ed.), 2003) collates and proposes a number of research methods appropriate to industrial design. Many of the new research methods aim to understand and define user experiences, an approach that is relevant to this study as its origins lie in personal experiences.

This study intended to draw on design research methods, but as the scale of the research grew, a decision was made to limit the scope of research methods to the literature review plus contributions from key informants. However, to present information in a way that is useful to design (information that does not just impart the raw data but adds a layer of interpretation) it is useful to use graphic models and diagrams. While industrial designers sometimes consider this a trite approach, it is nevertheless true that designers are visually sensitive and value the visual presentation of complex relationships and ideas.

Design practitioner and academic David Canaan comments:

Because my own creativity is based on creating visual relationships, I learn more by seeing than hearing. A picture is indeed worth a thousand words.... Researchers who add visual communications to their findings get significantly higher value from their insights. (Laurel, 2003. p. 237)

2.2.4 Ethics Issues in this Study

There are no special research ethics issues in this study. Much of the information has been extracted from the literature review. There is one semi-

structured interview with an overseas respondent, which took place as an email 'conversation', and included the necessary permissions. There are no research processes in the study that required a full submission or low-risk notification to the Massey University Human Ethics Committee.

2.3 *Data Gathering / Analytical Methods*

2.3.1 Literature Review: Introduction

As noted earlier in the chapter, the literature review was unexpectedly difficult. There is a large body of work about science fiction and a similarly large body of work about industrial design. However, there is very little material that acknowledges or explores any overlap between science fiction and industrial design. There are publications that *demonstrate* the overlap and relationship between the two areas, but few that discuss the relationship in the first instance. This aspect of the review shaped the remainder of the study.

The literature review covered both published and electronic media such as online publications, journals and websites. The Internet is a vast source of information, and the ease of access to the Internet means that it is more likely to reflect contemporary culture and attitudes than published works, which take longer to recognise and respond to shifts in culture and society. In this respect, websites and online discussion forums were valuable sources of information for this study.

The results of the literature review are broken into four areas:

- Industrial design;
- Science fiction;
- Industrial design and science fiction;
- Case studies.

The review for each area appears at the beginning of the appropriate chapter, to connect the results of the literature review more closely with the discussion within each chapter.

The analysis of science fiction media was a key aspect of this study, and many novels, television programmes and movie productions are referred to in Chapters 4, 5 and 6. If the work is used to illustrate a specific issue, it is listed in *vi Science fiction works used as examples in the text* at the start of the thesis accompanied by a brief description of the relevance of the work, and the relevant *issues* from each production are embedded in the text.

2.3.2 Analytical Tools

The tools noted in Section 1.9.3 were used to search for:

- Patterns and connections;
- Connections in the subtexts and ideas, as well as in the products and texts themselves;
- Overall themes rather than details.

These processes and tools include:

- The discussion of intention and perception;
- The discussion of impression and sensation;
- Themes in definitions rather than the definitions themselves;
- Recognition of stereotypes;
- Diagramming or modelling of aspects of the study as an analytical tool;
- Developing a taxonomy to describe the intent of the production design content in specific science fiction movies.

2.4 Case Studies

2.4.1 What is the Value of Case Studies?

Case studies were adopted as an appropriate approach for connecting observations of existing phenomena to analyse the industrial design/science fiction relationship. *Case Study Research: Design and Methods* by Robert Yin (2003) is a key text on case studies. Yin defines a case study as "... *an empirical inquiry that*

- *Investigates a contemporary phenomenon within its real-life context, especially when*
- *The boundaries between phenomenon and context are not clearly evident.” (Yin, 2003. p. 13)*

Yin states clearly where case studies are best employed:

In general, case studies are the preferred strategy when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. (Yin, 2003. p. 1)

This is because such questions deal with operational links needing to be traced over time, rather than mere frequencies or incidence. (Yin, 2003. p. 6)

...the most important [application] is to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. (Yin, 2003. p. 15)

The case study is preferred in examining contemporary events, but when the behaviours cannot be manipulated. (Yin, 2003. p. 6)

When the nature of the study questions was considered, the case study as a method was clearly an appropriate response to the qualitative ‘why’ and ‘how’ questions. The complexity and scale of the overall topic also supported a focussed case study method as an appropriate tool.

It was expected that the multiple case study approach would generate a certain amount of evidence replication that will help to test the hypothesis. Yin further suggests that the case study is a useful tool to assemble a theory based on a number of media or information sources:

... the case study’s unique strength is its ability to deal with a variety of evidence – documents, artefacts, interviews and observations –

beyond what might be available in a conventional historical study.
(Yin, 2003. p. 8)

... case studies, like experiments, are generalizable to theoretical propositions, and not to populations or universes. In this sense, the case study, like the experiment, does not represent a 'sample', and in doing a case study your goal will be to expand and generalize theories (analytic generalisation). (Yin, 2003. p. 10)

Case studies provide an umbrella approach within which Tolich and Davidson's statement (quoted on page 24) that fieldwork/qualitative methods are the preferred approach to generate theory based on observations of existing phenomena can be applied.

2.4.2 How Were the Case Studies Chosen?

The case studies in Chapter 6 represent specific aspects of the discussion and analysis in Chapter 5, and the relevance of these selections is built up through the thesis. The specific case studies and the reasons for their inclusion are discussed in Section 6.1.

2.5 Summary

The five central study questions can be addressed using secondary sources identified in the literature review. The eight supplementary questions need to be addressed using a variety of qualitative / quantitative and primary / secondary research methods. The literature review for each area is located at the start of the relevant chapter of the thesis.

Qualitative methods are the appropriate method to generate a theory based on observations of existing phenomena, and a variety of analytical tools will be used to structure the information generated by the literature review. Visual analysis methods will be used to structure and present some results. There are no ethics issues specific to this study.

Case studies are a highly appropriate method for examining the hypothesis, given that they can deal with a range of media, and assemble information from real-life observations. This matches the qualitative/inductive research approach proposed at the beginning of the chapter.



Chapter 3: Industrial Design

3.1 Introduction to the chapter

3.1.1 Introduction

The nature of industrial design needs to be thoroughly understood before the hypothesis can be explored in any depth. However, little is achieved by recapitulating existing material to assemble a chapter resembling an extended encyclopaedia entry on industrial design. This chapter identifies broad issues underlying industrial design outputs and processes: these issues are *mediation* through *forecasting* and an understanding of *responsibility*. A primary aim of exploring these issues is to underline the importance of understanding context, both in the analysing existing design outputs and in establishing the parameters for new products. This study is more concerned with industrial design as a deliberate activity, a profession and a process, than with industrial design as an idea.

The intent is to identify the wider relationship between design, context and the future: how and why designers design products, what processes are used to forecast the lifecycle of the product, and within what contexts those products will be used and evaluated.

The chapter describes the scope and intent of industrial design: what it is as an activity, as a profession, and what it is that industrial designers do. The stereotype of industrial design is described, and a four-level structure is outlined within which industrial design can be understood. The chapter also explores the definitions of industrial design and the history and development of the area, to identify key processes and ideas. The idea of 'good' design is discussed and related to the key idea of context.

Major issues of concern to contemporary industrial design and industrial designers are examined using the four-level structure. Many industrial design processes attempt to generate hard information as the basis for design decisions, and these are discussed to identify those that deal with context and use. The value of describing the role of industrial design is identified and

discussed, along with proposing what that role might be. The role of industrial design is then connected with the hypothesis.

Texts approach the analysis of industrial design from two directions: chronologically and thematically. The chronological approach, for example Heskett (Heskett, 1980) and Woodham (Woodham, 1997), charts the progression of industrial design from its coalescence in the eighteenth century, and the way that newer ideas are built on top of or react to older ideas. Thematic analysis, for example Sparke (Sparke, 2004), tends to highlight the relationship that industrial design has with society and how that is reflected in design activity and products. This chapter uses both approaches, and adds in ideas that establish the foundations of industrial design and how it operates.

This material draws heavily on the literature review, supplemented with limited use of diagrammatical analysis.

3.2 *Literature Review*

3.2.1 Introduction to literature review

As noted in Chapter Two, the literature review covered both electronic and printed media. The following themes were evident in the literature:

- Histories – chronological, thematic;
- Products – reviewed or analysed by themes, functions, materials, product technologies, manufacturers;
- Design theory – culture, form;
- Design methods – research, digital / conventional rendering, ergonomics;
- Design practice – processes, self-promotion by designers;
- Biographies – designers, manufacturers.

The literature review looked for answers to the central study questions:

1. What is industrial design?
2. What is the role of industrial design?

In addition, specific information that could connect industrial design and science fiction was assembled.

3.2.2 Key Texts

Design History and Design Theory

- *An Introduction to Design and Culture* (Sparke, 2nd edition, 2003)

The first edition of this book (published in 1986) was an important work on the role that design plays in the construction of culture. Like the first edition, the second edition is a thematic history that explores the relationship between design, society and culture, but addresses a wider range of design arenas including graphic, industrial, textile, and fashion design.

One of the differences between Sparke's work and that of many other writers in this area is that Sparke awards design a significant role in creating culture. However, Sparke's analysis of the design / culture relationship is penetrating, and is not always flattering for the design profession. This perspective is valuable to this study, as it provides a counterpoint to the more optimistic tone of many design texts. While Sparke describes her book as an introductory text, the critical nature of her writing provides a valuable insight into the role of design in the creation of culture. Her viewpoints provide direction and structure for the ideas in the most of this chapter.

- *Twentieth Century Design*. (Woodham, 1997)

This book is widely used as an introductory text for design students, owing to its scope, themes, and accessible structure. As a design history text, the structure of the book is generally chronological, although Woodham notes that a strictly chronological approach which recognises decades or movements is overly limiting. However, it is apparent that some issues are tied to particular eras, and equally, it is difficult to discuss bigger themes - such as social responsibility – within a chronological framework. The value of this publication lies partly in its breadth as a design history text, and partly in the way that it

covers a wide variety of media and – similar to Sparke – suggests that design ideas and products are related to contemporary culture.

- *The Industrial Design Reader* (Gorman (Ed.), 2003)

The Industrial Design Reader charts the development of the area with a collection of extracts from publications and speeches about design and design-related issues. The sources include many high profile designers, and reflect a wide variety of approaches to industrial design. There appears to be no particular agenda in the selection of viewpoints, other than to reflect the breadth of ideas that have directed the development of industrial design. These extracts are particularly useful as they enable themes that underlie the arena to be relatively easily identified. This material helped in the construction of ideas about the development of industrial design and also contributed to the analysis of definitions.

- *Industrial Design A-Z* (Fiell & Fiell, 2000)

In contrast to the design histories by Sparke and Woodham that chart the chronological development of design, *Industrial Design A-Z* largely focuses on specific manufacturers and designers, supplemented with some discussion of overall themes and chronology. The 'Themes and Materials' section is useful in charting the preoccupations of industrial designers, such as usability and sustainability. *Industrial Design A-Z* contributed to the sections of this chapter that discuss the development of industrial design, the idea of 'good' design, and contemporary preoccupations.

Design Processes

- *New Thinking in Design* (Mitchell, 1996)

New Thinking in Design was a crucial resource for this study. The book comprises a series of interviews with international design leaders, representing several international companies and consultancies. Mitchell has been interested in the area of product experience since the late 1980s (Gorman,

2003), and this is evident in his selection of interviewees. The following interviews were particularly useful:

- Michael McCoy (*Fahnstrom/McCoy*). McCoy is particularly interested in the semantics of form – an approach he terms ‘interpretative design’.
- Donald Norman (*Apple Computers*). Norman is an advocate of usability and human-centred design, and while his own publications explore these ideas in depth, here he discusses design as it relates to his experiences at *Apple Computers*, which is more relevant to this study.
- John Seeley Brown (*Rank Xerox*). Director of *Xerox*’s Palo Alto Research Centre, Brown has a background in human-computer interaction, and is interested in education and technology.
- John Thackara (*Design Analysis International*). A past editor of the British *Design* magazine, Thackara co-founded the consultancy *Design Analysis International*, which specialised in the management of design processes.
- Larry Keeley (*Doblin Group*). The *Doblin Group* specialises in what it terms Strategic Design Planning – design-based advice that applies all disciplines of design as a strategic device.
- Peter Schwartz (*Global Business Network*). Schwartz has significant experience in the use of scenarios for forecasting, and his consultancy *Global Business Network* uses scenarios as a strategic planning tool.

The theme that ties these interviews together is a sense of industrial design contributing at the strategic level in commerce, rather than as a more product-focussed, tactical tool. Mitchell directs his interviews towards defining leading-edge design practice, based partly on new design processes and partly on how design and designers interact with clients and commerce. It is these perspectives that are of interest to this study, and the influence of the experiences discussed in *New Thinking in Design* is evident throughout this chapter.

- *The Design Experience* (Press & Cooper, 2003)

This is a dense and sophisticated book, and in many ways has provided a model for the assembly of this thesis. *The Design Experience* balances an academic approach to design and design theory against a level of pragmatism

that makes Press and Cooper's viewpoints and conclusions highly persuasive. The authors use case studies as a tool to demonstrate the applicability of their ideas to professional practice. They employ many diagrams to communicate the complexity of these ideas: this recognises the need to communicate their ideas in a way that is relevant to designers. The book concludes with a short section on what Press and Cooper describe as 'the new designer', a set of ideas that are of direct interest to this study as they supplement the identification of the role of industrial design.

The Design Experience influenced this study in two ways. Its broad approach encompasses both contemporary ideas and practice (exemplifying the ever-present connection between design theory and practice), and also provides a sophisticated snapshot of the design profession.

- *Design Research: Methods and Perspectives* (Laurel (Ed.), 2003)

The methods described in this book reflect a multi-disciplinary approach to design research, and bypass dogmatic ideas about research methodologies. While the words 'qualitative' and 'quantitative' are used, these terms are used to describe methods rather than to create any sense of opposition between the two. Laurel collates methodologies, methods, and processes under four headings: people, form, process, and action.

The book demonstrates three things:

- Firstly, it shows that the industrial design profession has the confidence to engage with users as participants in the design process, rather than dictating to users what they will accept as an end product.
- Secondly, the sheer complexity of design research processes demonstrates the complex issues that swirl around the product itself.
- Thirdly, design research processes connect with the idea of human-centred design, which extends into the ideas of responsibility, sustainability, and with Press and Cooper's concept of 'the new designer'.

While reference to specific parts of *Design Research: Methods and Perspectives* in this study is limited, the direction, tone and feel of the book have been highly influential.

- *Design Secrets: Products* (Industrial Designers Society of America, 2001)

Design Secrets: Products is a relatively rare publication as it exposes the processes used in the design industry rather than just the end product. The processes evident in the book cover most of the design process from design sketching (both on paper and on screen), functional prototyping, sketch models in soft materials, 'looks-like' visual prototypes, CAD models using two- and three-dimensional design software, and technical specification drawings.

The book is biased towards the visual rather than the conceptual, and therefore lacks much in the way of design research that must have occurred prior to the initiation of most of these projects. However, there are similar concerns and approaches evident across most of these projects, and the material in this book has contributed to this study in the description of design processes and the industrial designer's focus in the commercial environment.

3.3 *What is industrial design?*

3.3.1 Scope

Designers have one truly remarkable skill that they themselves often do not fully appreciate the sophistication of – it is the power to simulate, to take something that does not exist and to make it utterly, totally understandable, believable, and concrete so that those with less imagination can understand it. (Keeley in Mitchell (1996. p. 130))

... designers are often thought of as the people you call in at the very end to make the product look pretty or maybe to fix up this little problem with usability... (Norman in Mitchell (1996. p. 90))

These two views of industrial design from people with long histories of exposure to the area express opposing views of industrial design from the inside and from the outside. Keeley is full of optimism about the abilities of designers, while Norman is expressing his experience of the role designers had been expected to play within a large manufacturer. These two quotes underline some of the issues that industrial design faces: a knowledge that the arena has something genuinely useful to offer but that the stereotype of industrial design interferes with its acceptance.

To understand what industrial design really is, the area needs analysis in both depth and breadth. Design, at its core, is described as doing something with intent. Morrison and Twyford define design as "*change through spontaneous or painstaking action derived from a decision arising from a synthesis of information*" (Morrison & Twyford, 1994. p. 15). As a subset of design, industrial design is focussed on design for industry and three-dimensional, mass-produced objects ranging from consumer products and furniture through to the exterior and interior of vehicles (Fiell & Fiell, 2000).

Industrial design aims to meet the needs of everyone involved in the lifecycle of mass-produced products including users, manufacturers and society. From design, development, and production to distribution, use and disposal, industrial designers are concerned with almost every aspect of the product and its lifespan (Press & Cooper, 2003). However, the distinctive contribution that the industrial designer makes to the design of the product itself is focussed in a small number of areas: aesthetics, function, and the interplay between the two, and the relationship between the user and the product at the intimate, cognitive and emotional levels.

Design for industry encompasses a wide range of design issues and projects. Mass production is a key element of manufacturing industries, and exists to enable larger numbers of products to be produced at lower unit costs (de Noblet, 1993). The consequence of mass production is that for production to be viable, the end product needs to be bought by a large number of people.

Almost by definition, mass-produced products will be used by a wide range of people (Dreyfuss, 1955).

In terms of the design of a specific project, therefore, the aims of industrial design are:

- To identify the needs of individual users in terms of intimate, cognitive, emotive and functional requirements;
- To shape and form the product so that it meets these needs;
- To resolve the potentially conflicting requirements of the possible range of users (for example, gender, experience, age, size etc);
- To synthesise the aesthetic, functional and interpretative elements of the product;
- To design the product to suit the needs of the market;
- To design the product to suit the needs of the manufacturer, including profitability, selection of manufacturing processes and materials, and other requirements of getting the product to the market;
- To meet both the short- and long-term needs of society.

(Dreyfuss, 1955; de Noblet, 1993; Press & Cooper, 2003; Burdek, 2005).

Bruce and Bessant capture most of these issues in their definitions of two ideas central to industrial design: creativity and innovation.

Creativity is the ability to combine ideas in new ways to solve problems and exploit opportunities.

Innovation is the successful application of new ideas in practice in the form of new or improved products, services or processes. (Bruce & Bessant, 2002, p. 32)

At the heart of innovation lie creativity and an ability to couple together know-how and an understanding of user needs. Designers have an ability to work with technology and capture this in a form that can be applied and used. (Bruce & Bessant, 2002, p. 33)

In terms of the product itself, designers are interested in two broad areas:

- Product experience - the immediate and long-term relationship that the user develops with the product. This includes every aspect that the users experiences through their five senses, as well as the quality of the emotional connection between user and product;
- Product performance – the measurable aspects of the product, both tangible and intangible.

(Press and Cooper, 2003).

The interests of industrial design have not always been so broad. In its infancy in the 19th and early 20th centuries, the profession focussed on the function and form of the product and the related ideas of profit and manufacturability (Van Doren, 1940). The design issues that faced industrial design at this stage were (in comparison to the technologies evident in contemporary products) relatively straightforward. Industrial design form-giving concentrated on the expression of movement and articulation, with classical industrial design methodology focussing on Louis Sullivan's famous dictum "*form follows function*" (Heskett, 1980. p. 62). This approach was intended primarily to faithfully render materials in their original characteristics rather than imitate other materials, but can also be applied to the overall architecture of the product (de Noblet, 1993).

The stereotype of industrial design largely stems from this phase of the development of the profession. The stereotype is understood as the triumph of styling over function, the prostitution of usability to the design of the exterior shell, the creation of products whose only reason for existence is that they are newer than the previous version – an approach to the manufacture of products that American industrial design Harold van Doren described in 1940 as "*slapdash superficiality*" (Van Doren, 1940. p. 16). While there will still be examples of products that have been designed without thought to their function, the gender of their users, or the contribution that the product makes to the contents of landfills, in general contemporary industrial design practice has moved far past these issues (Burdek, 2005).

Other professional groups are equally interested in the function and form of products, and can also shepherd them from concept to completion. But industrial designers are the only professional group who are trained to make

aesthetic decisions as part of this process, with the aesthetics, identity and semantics of the product a priority (Burdek, 2005). In addition to the ability to manipulate the exterior of a product with both form and function in mind, industrial designers address the physical and cognitive relationship between the product and its users. It is the only profession that draws together this range of activities in the design of mass-produced products (Press & Cooper, 2003).

Bruce Sterling, recently Visionary in Residence at the Art Centre College of Design in California, sees industrial designers this way:

One of the things I like best about designers is that, unlike scientific historians or techno-sociologists, they tend to be user-centric. They're not creating fine-art objects for their own sake, they are actually designing some thing for somebody – or at least some demographic. (Sterling, 2005a. www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006)

Industrial design depends almost entirely on commercial activity and production. The vast majority of industrial design projects are instigated by the manufacturing sector, although Sparke states that the relationship between design and manufacturing is mutually beneficial:

Design and designers are, and have been for many years, a sine qua non¹ of the modern commercial system ensuring, through the activities of production and consumption, that people's needs and desires (whether consciously acknowledged or not) are met by the visual and material images and artefacts that enter the marketplace and help us define who we are. (Sparke, 2004. p. 2)

However, industrial design is only part of the overall product development process that covers the entire production process from instigation of a product through to distribution and support.

¹ From the Latin 'Without which not'.

While an industrial designer might be interested or contribute to many of the activities in this process, the focus of industrial design is on the few key aspects noted on page 40. These aspects are the focus of the 'design process'.

Generally, the generic design process is broken into four phases. Press and Cooper describe these phases as:

- *"Basic research and innovation"*: understanding the problem or opportunity, understanding the needs of the market, the users and the manufacturer;
- *"Concept design"*: exploring a range of possible design solutions and selecting the most promising;
- *"Prototype development and testing"*: resolving the product experience and performance aspects of the selected concept;
- *"Final product or design engineering"*: translating the resolved design into a mass-produced product. This phase is also known as 'design for manufacture' (DFM).

(Press and Cooper, 2003. p. 43)

Industrial designers employ a variety of tools in the design process, including:

- Design-oriented research processes, including a broad range of methods intended to engage the users as designers, methods that explore user needs, and investigations into materials and processes.
- Tools to manipulate abstract ideas, such as mindmapping, brainstorming, and some design research methods.
- Concept investigation methods such as sketching, mock-ups and test rigs, aesthetic models, concept evaluation and selection methods.
- Technical specification methods such as technical drawings and prototypes.
- Communication tools such as presentation drawings in traditional and electronic media, and 'looks-like' models with a high degree of representation of the final design.

(Industrial Designers Society of America, 2000; Laurel, 2003)

Some of these processes are distinctive to industrial design, notably design sketching, 'looks-like' models, and presentation drawings. It is these processes, along with the designers' ability to synthesise information from a wide range of areas, which contribute to the sophisticated "*ability to simulate*" that Keeley is referring to in his quote on page 39. What distinguishes industrial designers from other professional groups in this area is that that these processes are not just communication tools but essential design tools.

John Thackara notes that "*The design process is the sum of the relationships between designers and technologists and communication people and marketing people and consumers.*" (Mitchell, 1996. p. 113). While what Thackara is referring to is more broadly recognised as the product development process (Ulrich & Eppinger, 2000), he highlights another aspect of the role that designers play in this process – that industrial design is a team activity. Very small projects may be able to be resolved by an individual, but the range of expertise required by complex design projects suggests that input from a wide variety of professionals is necessary to complete a project. The popular image is of the designer as individual hero: the magnetic personality who is easy to both identify and promote, based on the impact of designers such as Norman Bel Geddes, Harley Earl, and Phillippe Starck. However, this is not the reality of commercial practice.

Ulrich and Eppinger (2000) illustrate how industrial design activity is situated within the product development process, and also indicate which other groups contribute to that process. Figure 3.1 shows the range of activities involved in a modest product development team based on developing a small electronic product, adapted from Ulrich & Eppinger's work on the product development process (Ulrich & Eppinger, 2000). This shows the designer as one person within a team whose members represent potentially conflicting interests in the development of the product. This model suggests that the designer's tools will be required to *resolve* the industrial design aspects of the project, *communicate* those resolutions to the development team, and to *balance* the complex requirements of product manufacturing against the product performance and product experience requirements that the designer represents.

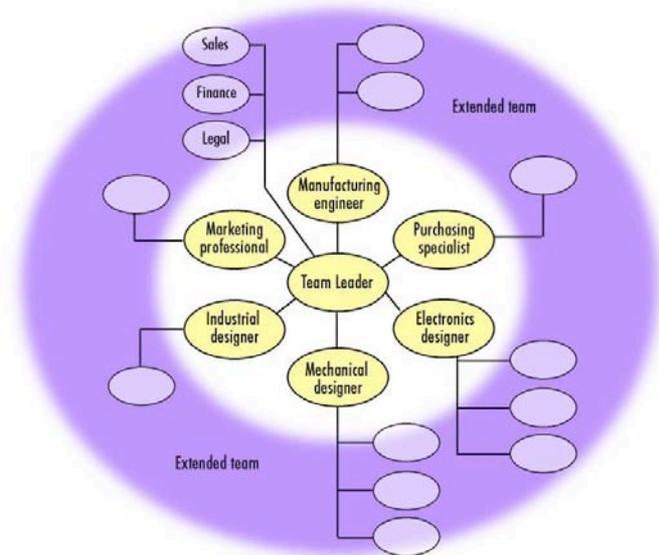


Figure 3.1
The range of people involved in the product development process (after Ulrich and Eppinger, 2000. p.5).

Misha Black's pragmatic assessment of the role of the designer in the design process notes that:

The design process is thus a co-operative one in which the designer works at the vortex of a creative storm. It is his duty to turn the product, be it a domestic vacuum cleaner or a diesel locomotive (or for that matter, a technical instruction brochure), into a coherent entity from the point of view of the producer and the user. This is the designer's primary task, to produce order from disarray. (Black, in Blake (1974. p. 22))

Industrial design as an activity can be undertaken by anyone with the interest and motivation, but the term is generally used to describe the work of industrial design professionals – people who have been trained in this role. Thackara notes, however, that designers are not an essential component of design processes:

Furthermore, one needs to distinguish between design as an activity and designers themselves. It causes terrible arguments and trouble when you make this point, but you can have a design process without designers. (Mitchell, 1996. p. 120).

As industrial design overlaps with other aspects of the product development process, and concentrates on aspects that are not the focus for other professions, industrial design as both activity and profession is vulnerable, as these aspects of a product can be difficult to quantify. While industrial design might be a critical element in the production of good products, it is not an essential element of the product development process (as identified by Thackara). Partly owing to this marginalisation, industrial design has developed a sense of profession evident in national professional bodies such as the *Designers Institute of New Zealand* (DINZ), the *Industrial Designers Society of America* (IDSA), and the *Chartered Society of Designers* (CSD) in the United Kingdom. These professional bodies share common roles in both member-oriented support activities and in external advocacy, promoting the idea of industrial design as well as contributing to the recognition of good design and design practice (<http://www.dinz.org.nz>; <http://www.idsa.org/>; <http://www.csd.org.uk/>).

3.3.2 Levels

This study considers that industrial design is four things:

- Product – the designed product that emerges from mass-production processes;
- Process – the part of the product development process that designers contribute directly to;
- Activity – the overall arena of industrial design activity related to specific projects (which may or may not include designers);
- Profession – differs from industrial design activity in that there is a sense of advocacy and professional camaraderie evident in the work of professional organisations, and that academic institutions contribute both graduates and theory to enhance a sense of professionalism.

The relationship between these aspects of industrial design is shown in Figure 3.2.

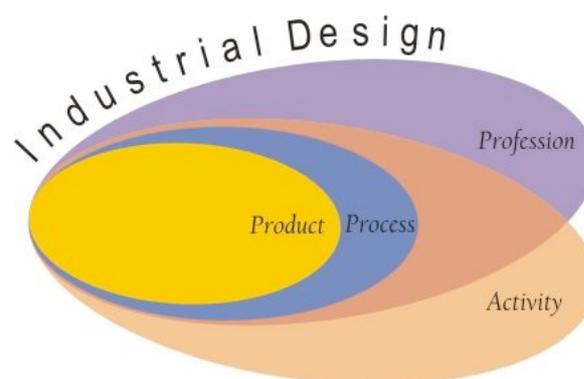


Figure 3.2
Levels of industrial design

3.4 Defining Industrial Design

3.4.1 Definitions

It was not until the emergence of industrial design as a profession that the exercise of defining the field was considered necessary. An analysis of a number of definitions is potentially useful in identifying their common themes, and it is evident that these themes respond to the development of industrial design as a profession.

Early discussions of industrial design tended to focus on the product itself: form, utility, materiality and production, and the mechanics of the relationship between designer and manufacturer. In 1940, in the infancy of industrial design as a profession, pioneer American industrial design Harold van Doren defined the field as:

... concerned with three-dimensional products or machines, made only by modern production methods as distinguished from traditional handcraft methods. Its purpose is to enhance their desirability in the eyes of the purchaser through increased convenience and better adaptability of form to function; through a shrewd knowledge of consumer psychology; and through the aesthetic appeal of form, colour and texture. (Van Doren, 1940. p. 3).

This definition focuses on a specific project or product. Van Doren has described the basic tenets of industrial design as mass production, form,

function, and market appeal. These issues remain at the core of industrial design. They are the cornerstones of the profession; things that are taken for granted as more complex or topical issues are addressed.

In 1950, Edgar Kaufmann, Jr. curator of the Museum of Modern Arts, New York, said that:

Modern design is the planning and making of objects suited to our way of life, or abilities, our ideals. (Gorman, 2003. p. 148)

Kaufmann's description of industrial design shows a broadening of interests, and recognises the development of complex relationships between users and designed objects. The genesis of contemporary design themes such as lifestyle and branding is evident in this definition.

By 1980, industrial design was both defining its own ground to a large extent and also defining the profession. Misha Black, head of the Royal College of Arts in London, noted the role of industrial design in synthesising the needs of the user and of both manufacturing and product technologies:

Industrial design is not art, but nor is it only science and technology. It is a creative process in which engineering necessity is equated with human needs. (in Blake, 1974. p. 34).

Black described industrial design as a creative process, a clear indication that industrial design was seen not only as the final product but also as the methods used to design that product. In 1988, C. Thomas Mitchell expanded on this process-driven approach to design:

In place of the concept of design as simply a means of producing objects, develops an understanding of designing as a continuous and non-instrumental thought process, a creative act in which everyone, designers and non-designers alike, may participate equally. The designer's role in the post-mechanical era is to make the design process equally accessible to everyone. (Gorman, 2003. p. 215)

Mitchell's term "*post-mechanical design*" is a useful concept, and appears later in this study.

In 2005, Burdek declined to offer "*yet another definition or description of design*" (Burdek, 2005. p. 16) but instead listed a number of tasks that design should fulfil:

- *visualise technological progress,*
- *simplify or make possible the use and operation of products (hardware or software),*
- *make transparent the connections between production, consumption, and recycling,*
- *promote and communicate services, but also – pursued energetically enough – help to prevent products that are senseless.*

(Burdek, 2005. p. 16)

Burdek encompasses Van Doren's focus on the physical attributes of the end products of industrial design, refers to the ideas inherent in Mitchell's concept of post-mechanical design, and adds references to design's responsibility to society. This is a clear example of a definition or description of industrial design that has built on the core industrial design activities of form, utility, processes and profit, taking them for granted rather than dismissing them.

3.4.2 Themes

What is apparent from this examination of definitions of industrial design is partly what industrial design is (or was at the time the definition was proposed) but more about the themes that design has been concerned with. The themes evident in these definitions are:

- Designing three-dimensional objects;
- Industry and mass production;
- Technology;
- Form and styling;
- Usability and ergonomics;

- Profit and marketability;
- Design as both process and outcome;
- Vision / responsibility;
- Recognises context and culture;
- Engages with emotive and spiritual qualities.

While not as eloquent as many of the definitions of industrial design, this list captures the breadth of interests of the profession.

A key issue evident in these definitions is that industrial design processes, products and practices have become far more sophisticated since the birth of the profession. This reflects not only the development of more sophisticated product and manufacturing technologies, it also reflects that new directions in the design profession have been built on top of existing activities: for example, affective ergonomics can only exist when cognitive and physical ergonomics have been resolved. Likewise, the issues that industrial design is currently concerned with (product experience, branding, sustainability, semantics) can only be satisfactorily applied when product performance is largely understood.

3.5 *History and Development*

Industrial design is a relatively new activity. The key distinction between industrial design and craft is that designers create products that *other people* make – a distinction that had no meaning until the industrial revolution (Heskett, 1975).

There are two issues in the history and development of industrial design that are of interest to this study.

- The development of industrial design as an idea and a profession;
- The development of a sense of responsibility.

There are two approaches to discussing the development of industrial design. One viewpoint (for example, Heskett, 1980) is that the origins of the industrial designer are in the 'industrial artists' employed by the English industrialist Josiah Wedgwood in 1769. Wedgwood's factory 'Etruria' pioneered mass-production techniques by employing the first working artists to design objects that were then made by others. These industrial artists were made necessary by an increasing demand for products, as traditional craftsmen could not produce their wares fast enough to meet growing consumer demands.

Advances in the practice and acceptance of design for manufacture occurred in Britain, Germany and the United States during the next 150 years. Significant examples include the work of English botany teacher Christopher Dresser, and the mass-production of Colt firearms in America (Heskett, 1980).

This study proposes this viewpoint as the trajectory of the *perception* of industrial design; a history where we look at both products and design processes, and see things happening that can now be seen as industrial design in its infancy.

The alternative trajectory proposed by this study is the history of the *idea* of industrial design; a history that is slightly shorter and starts with the work of Peter Behrens at German electrical products manufacturer AEG in the early 1900s. Burdek describes Behrens as "*one of the key pioneers of modern design*" (Burdek, 2005. p. 27). His work for AEG included buildings, products and graphic material in a deliberate attempt to create not only a unified public face but also a sense of company culture (Woodham, 1997). The development of the Bauhaus design school in Germany is also part of the deepening of the *idea* of industrial design, and proved to be a major factor in the development of industrial design as a profession (Heskett, 1975; de Noblet, 1993; Burdek, 2005). The key phrases 'less design is more design' and 'form follows function' are the legacy of this era (Burdek, 2005).

The difference between *perception* and *intention* is in the recognition that designers were contributing to a profession and that they were part of the 'idea' of industrial design. This is a descriptive not judgemental distinction.



Figure 3.3
Norman Bel Geddes Streamlined radio
(1939). *Metropolitan Museum of Art*
http://www.metmuseum.org/toah/images/h2/h2_2001.722.11.jpg



Figure 3.4
Henry Dreyfuss' locomotive
expresses the ideas of Streamlining
in a mobile product.
Fiell & Fiell, (2000. p. 69)



Figure 3.5
Raymond Loewy's Coldspot refrigerator
(1935): Streamlined forms on a static
object. [raymondloewy.org](http://www.raymondloewy.org)
<http://www.raymondloewy.org/images/gallery/fullsears.jpg>

The Streamlining aesthetic grew out of industrial design's first brushes with modern consumerism. Streamlining was a stylised approach to the external form of a product, based on the minimum-resistance forms developed for aircraft (de Noblet, 1993). Streamlining was essentially an American phenomenon: it symbolised American faith in technology and its importance to the country's developing commerce-based culture (Meikle, 2001). Norman Bel Geddes was the main proponent of the style, and his products included both the pragmatic and the conceptual. The philosophy is also evident in the design of static products like Raymond Loewy's *Coldspot* refrigerator and the very mobile locomotive designs of Henry Dreyfuss. The optimistic, commerce-oriented themes of American pre-war industrial design were demonstrated at the 1939 World Trade Fair in New York (de Noblet, 1993; Meikle, 2001). The contribution of industrial design to the fair was not only evident in the design of several key pavilions; it was also apparent in the celebration of production and consumption. The stereotype of industrial design stems from this period in the development of the area.

The American designer Henry Dreyfuss (noted in Section 1.5) was responsible for advocating the role of ergonomics in industrial design. Ergonomics (the art of designing products and environments around the needs of users) (Dreyfuss, 1955) became an important issue in product and vehicle design. Dreyfuss' full-size illustrations of the male and female mannequins (known as Joe and Josephine) became standard issue in the studios of industrial designers, and symbolised the designers' desire to optimise the function of designed products (Dreyfuss, 1955). This interest in ergonomics can be seen as the beginning of industrial design's sense of responsibility.

In the late 1950s, Raymond Loewy coined the acronym *MAYA*, which means 'Most Advanced Yet Acceptable'. Loewy's contention was that there are products that are too advanced to be accepted by the market. (Loewy in Gorman, 2003). As an approach to industrial design, this sits firmly in the consumerism camp, and also hints at an element of elitism – that the designer knows best. This technological and conceptual elitism is strongly evident in the work of the Bauhaus and the development of the machine aesthetic (Woodham, 1997).

The development of a design conscience based on an increasing social awareness of the impact of pollution and the potential for nuclear disaster was a reaction to the affluent 1950s and 60s (and the American advocacy of production inherent in ideas such as planned obsolescence) (Woodham, 1997). Victor Papanak's influential book *Design for the Real World* (1974) questioned the role of industrial design in the promotion of consumption and the production of waste, and was something of a bible for industrial design students in the 1970s. This indicates an understanding of the profession's responsibility to the society that uses its products.

Contemporary design practice is informed by a variety of influences. In something of a self-fulfilling circle, the industry (both product and production technologies) and the marketplace have become more sophisticated, industrial design methods and products have responded by developing new approaches to understanding what the user needs and how products can be designed to meet these needs (Burdek, 2005). Contemporary industrial design issues are discussed further in Section 3.7.

3.6 *'Good' industrial design*

3.6.1 What is good design?

The idea of 'good' design is of value to this study, as it provides an insight into what industrial design is trying to achieve, how both time and other people assess industrial design outputs, and the ever-present relationship between industrial design and context. There is a clear subtext to the word 'design' that implies 'good' design. Many of the definitions noted in Section 3.4.1 can be viewed as not only defining design but also describing good design.

Early definitions of good design are focussed on the product and the service that the designer is supplying to industry. In 1955, Henry Dreyfuss felt that:

Good industrial design addresses and resolves five points: utility and safety, maintenance, cost, sales appeal, appearance. (Dreyfuss, 1955. p. 178)

Raymond Loewy's definition of good design from the same period cut to the core of the emerging profession, and shows an almost mercenary attitude to the role of industrial design.

Industrial design keeps the customer happy, his client in the black and the designer busy. (Loewy, cited on *Raymond Loewy: the father of industrial design. About: quotes:* <http://www.raymondloewy.com/about/quotesby.html>)

By contrast, contemporary definitions are very broad. Larry Keeley's background in Strategic Design Planning at *Doblin Group* informs his views of good design.

To me, good design always transforms. It always viscerally affects users, makes them delighted, changes their activities, changes what's possible for them. Good design is always about changing users' experiences positively. I define users very broadly too, by the way, not just to denote those who initially use an artefact but also the rest of us who are victimised when it's chucked out. (Mitchell, 1996. p. 138)

Keeley's definition of good design includes the quality of the product experience and the lifecycle of the product. This is a much broader understanding of what good design means. Michael McCoy, designer and design academic, suggests one of the broadest definitions:

My idea of a good design is one that is appropriate to its use and its context. (Mitchell, 1996. p. 11)

McCoy's definition recognises his own interests in developing design that responds almost entirely to its context of use rather than the designer's context. McCoy refers to this approach as 'interpretive design' (Burdek, 2005).

In the same way that definitions of industrial design have developed over time, descriptions of good design have broadened, and have taken for granted the issues previously seen as crucial. If there is any theme drawing these contemporary ideas of good design together, it is their breadth and their recognition of context. This breadth of understanding is apparent through contemporary industrial practice.

3.6.2 Context

Context is a critical element to the analysis of industrial design – both in terms of analysis of existing products and in the creation of new ones. Based on an analysis of design history texts (for example, Fiell & Fiell, 2000; Tambini, 1999), this study suggests that there are several possible layers of context:

- User (age, gender, abilities, culture' etc);
- Task or function (commercial, domestic, sport, recreation' etc);
- Physical surroundings (inside, outside, domestic, nationality, etc);
- Design context (designer, movement, culture);
- Technology (product technologies, materials, production technologies);
- Cultural / political / social (country, semantic's etc).

Some design issues and products can only be completely understood against their original background. The importance of analysing contexts can be demonstrated through the following three examples.

3.6.2.1 Technology / task / user

As an example of technological context, from a contemporary perspective it is hard to imagine life without portable electricity in the form of dry-cell batteries (rechargeable or not). Batteries are at the heart of products ranging from laptops to toys, and the convenience of cordlessness has become an everyday fact of life. Evaluation of products designed before the era of the battery is challenging: they appear simplistic and naive, but to be able to judge these products one needs an understanding of their context. For example, the Addiator Duplex Adding and Subtracting Machine currency converter is a mechanical product designed to add and subtract pre-decimal pounds, shillings



Figure 3.6
The cordless Addiator Adding and
Subtracting machine.

and pence. The brass casing is decorated with an abstract texture with an Art Deco feel. Its format is almost identical to a contemporary pocket calculator or Personal Digital Assistant (PDA), and even includes a stylus for inputting data. This is a curious product from the pre-battery era whose function is so specialised that it has no relevance at all to someone whose experience is based on battery-powered products and decimal currency.

3.6.2.2 Technology/ designer / movement

Marcel Breuer's Wassily chair (1925) is widely acknowledged as a design classic (de Noblet, 1993). Viewed in isolation, the chair is an interesting if not particularly comfortable piece of furniture when viewed in the confines of a photographer's studio (i.e. completely divorced from any sense of context) but becomes a benchmark design when considered more broadly in the development of steel tube furniture; even more important as an output of the Bauhaus and Breuer himself, and therefore an icon of Modernism (de Noblet, 1993). Within these different, broader layers of context, the chair emerges as a design classic.



Figure 3.7
The Volkswagen Beetle: 1939
version (top), 1998 version
(bottom).
Fiell & Fiell, (2000, p. 537)

3.6.2.3 Political / cultural

The 1990s *Volkswagen* Beetle is a complex example of cultural context that demonstrates the relationship between context and good design. The car has attained cult status through its relationship with the original Beetle, even though the connection is limited to name and body shape. The original 1930s Beetle was a car born of the demands of Hitler's Germany, and became a design classic partly through ubiquity, longevity, aesthetics and utility (Fiell & Fiell, 2000). Perversely, the Beetle became an icon of the 1960s American counterculture, precisely because the German car represented a completely different approach to vehicle design from its American counterparts.

Volkswagen revived the body shape of the original Beetle in 1998. An analysis of the 1998 Beetle shows the effort required by the design team to shoehorn a body designed around a rear-engine, rear wheel drive format onto a front-engined, front wheel drive platform. The lack of headroom in the rear seat and the large shelf of plastic that fills the gap between the dashboard and the base of the windscreen are the results of this mismatch. While the car itself has

been a commercial success (partly owing to its distinctive external forms) the design makes little sense without an understanding of its origins and context.

3.6.3 Design Classics

Design classics are products that have been widely recognised as being significant through longevity, originality, influence, or ubiquity. Design classics are occasionally recognised not just because of the product itself, but also because of other factors such as their historical significance, the designers themselves, or their significance to contemporary culture. It is pointless analysing design classics individually within the bounds of this study, but as a subset of the understanding of good design and the connection between good design and context, design classics highlight two issues.



Collect all five.



Figure 3.8
Apple Computers' iMac: created a fresh aesthetic based on materials and design innovations (1998).
Macdesktops.com
<http://images.macdesktops.com/images/640x1024/Collection640x1024.jpg>

First, some products are seen as design classics only in hindsight – these are products whose contribution to contemporary culture is only evident or valued at a distance. An example is *Chrysler's* Airflow car: a commercial failure at the time of release in 1936 but an interesting piece in the context of the Streamlining movement (Fiell & Fiell, 2000).

Secondly, some products have created new paradigms and are therefore instantly recognisable as design classics. *Apple Computers'* 1998 iMac is one example of a product that became an immediate design classic through its innovative approach to materiality and function (Fiell & Fiell, 2000, Bruce & Bessant, 2002). The iMac was a significant departure from existing computer designs, and the design of the enclosure suggested that product technologies could be celebrated rather than hidden. While the design of the iMac as an object is intriguing, it is in the context of creating a new relationship between people and products that the design is particularly successful.

Chairs also demonstrate the complexity of issues affecting the longevity of products. This study suggests that chairs represent the collision of a number of design contexts:

- Pieces that represent the work of renowned designers: for example, the work of Frank Lloyd Wright, Mario Bellini, Philippe Starcke.



Figure 3.9
Ross Lovegrove's 'Go' chair (1999):
an example of a chair that succeeds
through the designer's control of
form. *Hill International*
http://www.hill-inter.co.jp/catalogue/2lounge_chair_image/go_chair_sub_01.jpg

- Beauty: for example, Ross Lovegrove's Go chair, Alvar Aalto's Sanatorium chair.
- Chairs that represent the ideas of identifiable design movements: Modernism / Barcelona chair, Art Nouveau / Hill House chair, De Stijl / Red and Blue chair.
- Materials innovation: for example, Thonet chairs, Wassily chair.

What is clear is that there is a wide variety of ways that design can be judged, and that there are a variety of contexts within which design classics can be understood. It is equally clear that it is difficult to assess any product without understanding how it relates to several possible contexts.

3.7 Themes and Issues in Industrial Design

As noted earlier, the preoccupations of industrial design have broadened significantly since it was intentionally explored as an activity in the early twentieth century. Understanding the themes that permeate contemporary industrial design is useful in building the 'big picture' of what it is trying to achieve.

3.7.1 Product

3.7.1.1 Human-centred design / universal design / ergodesign / usability

A theme evident through design literature since the 1980s is the idea of 'user centred design', a principle also described as 'universal design' (Press & Cooper, 2003). This is an expansion of the use of ergonomics in the design process: once ergonomics provided a reliable tool to assist the industrial designer in fitting the product to the person, it became evident that an application of anthropometrics to the design of a product was not enough to ensure that it met all the users' needs. Human-centred design, usability, and ergodesign (a conflation of 'ergonomics' and 'design') are terms used to suggest the necessary integration of broader user needs with the design of the product itself. These include the obvious physical / intimate needs required

though physical contact of use of the product, the way that the product communicates its functions to the user, and the emotional connection between user and product.

The design of the interface between the user and product technologies has also been the focus of design attention – so much so that the interface designer (part psychologist / part technologist) has become an integral part of many product development teams. The way that the functions of the product are accessed through the visual interface, and the relationship between the interface and the physical controls, are critical elements of any design project for electronic products (Burdek, 2005). The nature of the interface can make or break a product: *Apple's iPod* is an example of a product that has made a virtue out of a well-resolved interface.

In his interview with Donald Norman in *New Thinking in Design*, C. Thomas Mitchell identifies the trend from technology-driven products to interface-driven products when he frames a question beginning with the statement "*I was curious about how the transition from technology-driven designing to a more people-focussed approach might occur.*" (Mitchell, 1996. p. 97). Michael McCoy sums up this approach when he says "*We just see technology as our clay, our medium to work with rather than as the determinant of the whole environment.*" (Mitchell, 1996. p. 6).

The desire to understand products from the perspective of the user shows a significant change from Modernist approaches to design where the designer controls every aspect of the interaction that the user has with the product. Design research methods have also changed to accommodate this shift in attitude to the user.

3.7.2.1 *Product experience*

Product experience is an umbrella term covering the ideas of usability and ergodesign, and also engages with the ideas of semantics and semiotics. Press and Cooper define semantics as "*the study of how meaning is interpreted from signs. It is applied especially to popular culture including advertising, photography and product design.*" (Press & Cooper, 2003. p. 206).

Signs and their meaning can be applied to the design of products in two ways.

Firstly, the product must communicate its operation to those using it. This includes making the operation of the product obvious, from communicating how the product should be held (through form, colour, and detail) to how controls should be operated (a control should show through colour, form and symbol if it needs to be pushed, slid, squeezed, and so on). This may include aspects of the design such as aural and tactile feedback (Burdek, 2005).

Secondly, the product uses its form to communicate intangible aspects of ownership that build into an emotional relationship between user and product (Burdek, 2005).

Product experience is therefore built around a multi-layered approach to the design of the product, which demands a strong understanding of how and in what contexts the product might be used.

3.7.1.3 Complexity / product technologies

As products and markets become more complex and as technology offers the possibility of more sophisticated product solutions that are user-based rather than product technology-based, human-centred design and product experience have become important aspects of industrial design projects (Norman, 2004).

As noted in the previous section, the development of product technologies has reached the point where the relationship between the inside and the outside of the product is not the result of restrictions related to product technologies. Product form was previously constrained by the need to encapsulate technology that could only be reduced in size by a given amount. The design problem has become how best to express the function and meaning of the product through form.

For example, the quest for smaller, more portable cellphones was limited initially by the size of the circuit boards and the size of the batteries.

Cellphones designed in the late 1980s were powered by four large 'D' cells, so that the design of the phone exterior was therefore a packaging exercise – how



Figure 3.10
Technophone cellphone concept
(1987): the design of this product was
severely restricted by available product
technologies.

best to place the controls on an exterior that was far bigger than convenient. Current cellphones employ tiny lithium ion batteries not only to do the same thing as the older phones but also to provide a vast additional range of functions. The limitations on the size of contemporary cellphones are not based on product technologies, but on ease of use, aesthetics, branding, and affective issues.

Whereas previous research methods were focussed on what was technically achievable, newer design research methods increasingly explore the needs and wants of potential markets or individual users. We need to understand what is best for the lifecycle of the product and how it relates to the wider needs of society.

C. Thomas Mitchell's term 'post-mechanical design' noted in Section 3.4.1 applies in the areas of usability, product experience, and complexity. In an era when the form of a product does not necessarily depend on what is inside the box, industrial design has to find product forms that create meaning for the user, and communicate operation, experience and branding.

3.7.2 Process

There are two aspects to industrial design processes.

- Product design processes: two-dimensional digital or physical sketching processes, and three-dimensional processes such as modelling and prototyping.
- Design research methods: generate both product performance and product experience information that is of direct use to the designer.

There is some overlap between these aspects of process.

3.7.2.1 Product Design Processes

Most design processes revolve around representations of the concept or product in two or three dimensions. These representations are used for three purposes:

- They allow the designer to understand the complexity inherent in any three-dimensional object;

- They allow the people involved in the design process to evaluate design proposals;
- They communicate these design proposals to people outside the design team.

These aspects of the design process are one focus of designers' "*ability to simulate*" noted by Keely in Section 3.3.1, and one way that industrial designers make the future visible.

One of the key simulation tools is the presentation drawing: the presentation of the potential product with a high level of definition. These drawings have traditionally required a large investment of time, but the level of simulation and persuasion is very high. Traditionally these drawings have been done by hand, using spirit based markers supplemented with a variety of artistic media (Powell, 1985). Recent software developments have overtaken these presentation drawing methods, and the electronic tools offer the ability to better communicate design ideas with less effort on the part of the designer (Burdek, 2005).



Figure 3.11
Vector and bitmap design software can produce images that enhance the designer's ability to simulate.
Jones, D. (2006)

It is useful for this study to note the impact that three-dimensional modelling software has had on industrial design (and other design areas such as architecture and cinematic special effects). One impact is on the nature of the product itself: 'blobjects' is a term used to describe products that are highly organic in appearance, and are the result of new software design tools combined with advances in production technologies (particularly plastic moulding). *Apple Computer's* iMac and *Volkswagen's* 1998 rendition of the Beetle car are examples of blobjects (Cullerton, 2005. <http://www.metropolismag.com/cda/story.php?artid=1235>)

Another impact is that some CAD outputs, particularly static images and animations from three-dimensional modelling software, exhibit the tendency to overwhelm the design, where the representation of the object becomes more powerful than the object itself. Surfaces appear harder and more detailed, and reflections become crisper than in real life. These images can be described as 'hyperreal'. Press and Cooper (2003) define 'hyperreal' as the state where



Figure 3.12
An example of the hyperreal nature
of images produced by CAD
software.
Jones, D. (2006)

"Signs take on a life of their own... surface appearance and signs are the new reality", and attribute the concept to French philosopher Jean Baudrillard (Press and Cooper, 2003. p. 205). What separates these images from those produced by traditional rendering media is the lesser amount of time required to reach this level of definition with software, and that software provides the ability to make alterations with a minimum of effort. These software tools bring this type of imagery within range of most designers. Images of this nature give the impression of being good design, but do not guarantee that the final product itself is well designed.

Bruce Sterling describes the way that these tools have changed how industrial designers learn and practice:

There used to be a big difference between media design and industrial design. I am watching that difference melt and vanish into the air. There are young folks at my school making motorcycles, and you never see them touch a welding torch or a drive train. They're making motorcycles on computers with a program called Solidworks, a kind of word-processor for actual objects. They're not "computer guys." They're flat-out motorcycle guys, but of a new breed. Art Centre has a big transportation school, and for them and their successors, that's simply what a motorcycle is. It's the interactive schematics for a motorcycle, and the thing with a kickstand is just a kind of hard copy.

(Sterling, 2005b. www.austinchronicle.com/issues.dispatch/2005-03-04/screens_feature.html)

Modelmaking processes are another simulation tool that have traditionally been used by industrial designers, both for concept development and communication. Designers often construct models to help them understand ideas, but the ability to simulate is most evident in the 'hard' or 'looks-like' models that are typically constructed towards the conclusion of a design project. These models have a high degree of representation. Modelmaking processes have recently been supplemented with new hardware such as rapid prototypers (also referred to as three-dimensional printers) and laser cutters,

which are changing the way that industrial designers develop products. Rapid prototypers construct three-dimensional objects directly from three-dimensional design software, and potentially provide a shorter path to a hard model. These new processes offer significant opportunities for simulation.

These are all key developments in the ability of the industrial designer to develop, simulate and present design ideas.

3.7.2.2 Design Research Methods

Research methods employed by industrial designers have previously focussed on evaluating designs in a conceptual, prototype or finished form, or research based on marketing information. Traditionally, the marketing aspects of product development have generated most of the information about potential product users. Larry Keeley has a sceptical view of the value of this process:

We don't think it's sensible to design anything unless you've got a sense of what users need and want. We also think that marketing, the industry that purports to best illuminate what users need and want, is deeply, profoundly, and utterly flawed...

Most designers truly hate research for reasons they cannot put their fingers on. ...research as it is conventionally done...violates the spirit of the enterprise of design. (in Mitchell, 1996. p. 136)

Instead, contemporary industrial design research is characterised by a breadth of methods and the desire to engage users in dialogue about existing products and latent needs. Research may also cover relevant information about potential markets. As noted in the literature review, Brenda Laurel's book *Design Research: Methods and Perspectives* (Laurel (Ed.), 2003) collates a number of contemporary approaches to generating information that is of direct value to industrial designers. These new approaches encompass a wider range of methods that engage users through activities such as role-play, drawing and fabrication, and are used at the front end of the design process rather than at the conclusion.

A model that encapsulates and illustrates many of these new methods is 'Make/Say/Do' developed by Liz Sanders at Ohio University. Make/Say/Do draws together processes where people are asked to make things (Make), as well as the traditional interviews / focus groups (Say), and are observed doing the real thing (Do) (Sanders, in Frascara, 2002). Sanders notes that this range of design research methods enables designers to better understand how users might experience a product (Sanders, in Frascara, 2002). Manufacturers exploring the theoretical aspects of industrial design include *Phillips* (Holland) and *Apple Computers*, while consultancies such as *Doblin Group* (USA) and *IDEO* (USA) have contributed important tools, indicating that these tools are not an academic exercise and have value in the commercial environment.

John Seeley Brown comments on this change in focus of design research from a designer-centred approach to a methodology that explores how ideas operate in their context:

How do you honor the context? How does the context shape perception? How does interacting with and in the context actually cause things to emerge that you didn't even know you knew? So it's much more a sense of shifting our focus from decontextualised, disembodied knowledge, which focuses on the individual's mind, to full-blooded activity in a context. (Mitchell, 1996. p. 103)

Scenarios are a forecasting tool that use an understanding of contemporary and historical events and issues to construct possible futures within which products might exist, and are an important tool in the understanding of context. Scenarios map out both detailed and overarching ideas that might affect products being designed today. Peter Schwartz of *Global Business Network* constructs scenarios that relate "to an actual choice one has to make rather than an abstract exploration of the future." (Mitchell, 1996. p. 140). This overlaps with the *Strategic Design Planning* approach used by Larry Keely's *Doblin Group*, although the *Doblin Group* apply scenarios as part of a broad approach that includes the design of products that might fit within a range of scenarios (Mitchell, 1996). Schwartz notes that "good scenarios actually consist of three different models of the future, not the same model run three

different times, where you tweak one variable or another" (Mitchell, 1996. p. 141).

3.7.3 Activity

3.7.3.1 Innovation

Innovation is a key concept for both industrial design and commerce, and a critical concept for this study. The nature of the marketplace requires new products to offer something identifiably different – and not just different, but better. Press and Cooper link design and innovation together very clearly: *"Design is now being recognised as a vital ingredient for two issues, which are foremost activities in most organisations and businesses: innovation and identity."* (Press & Cooper, 2003. p. 40). They define innovation as:

...developing new products and services for the marketplace, new means of producing or delivering them, or new procedures and processes that contribute to organisational change. Innovation may follow from research that leads to an invention, a new set of design principles or new definition of market needs. (Press & Cooper, 2003. p. 205)

Bruce and Bessant clearly link design with innovation in their definition of design: *"Design is the purposive application of creativity throughout the process of innovation."* (Bruce and Bessant, 2002. p. 33).

Design research processes have a role to play in innovation, as do product design tools relating to the ability to simulate and communicate product concepts. What new ideas are needed or where new technologies can be best applied can be understood by a strategic application of design research methods. Forecasting tools (including scenarios) can also interrogate design ideas to investigate the implications of design decisions.

3.7.3.2 Branding

The related ideas of *branding* and *identity* recognise the need for a relationship between different products from the same manufacturer – usually with the



Figure 3.13
Dyson DC15 vacuum cleaner
(2005): an example of branding
integrated with product form. *Bed,
Bath and Beyond*
[http://www.bedbathandbeyond.com/as
sets/product_images/380/3872010666
8C.JPG](http://www.bedbathandbeyond.com/assets/product_images/380/38720106668C.JPG)

product aesthetic as a key element, but may also cover other aspects of product experience such as sound or material. Products may be designed within an overall brand identity, using repeating ideas and design elements to reinforce the relationship between the market and the manufacturer. Sparke cites *Dyson* vacuum cleaners as a prime example of the creation of a brand by design and the value in the concept (Sparke, 2004). The concept is clearly evident in the product lines of *Apple Computers*, *Sony Electronics*, and every contemporary vehicle manufacturer. In a paper published in *Long Range Planning Journal*, Ravasi and Lojacono describe the relationship between design and branding: “*Design is not simply a matter of enhancing functionality or styling, but is a powerful symbolic medium for expressing or reinforcing a brand.*” (Ravasi & Lojacono, 2004. p. 71)

3.7.4 Profession

3.7.4.1 Industrial Design and Commerce

From a broader perspective, industrial design, along with most other aspects of design such as graphic and textile design, both responds to and contributes to the development of material and social culture. Production and consumption have been key activities in society since the industrial revolution, and industrial design contributes to both by creating a conduit between manufacturing and markets that enables manufacturers to better meet the needs and desires of their customers (de Noblet, 1993). Sparke describes this aspect of the relationship between design, commerce and culture:

Design crossed the technology / culture divide: as a process which was intrinsic to mass manufacturing, as well as a phenomenon which communicated sociocultural values, it was embedded equally firmly within the worlds of production and consumption. Indeed, it was one of the key forces that helped to link these worlds together and make a seamless connection between them. (Sparke, 2004. p. 34)

3.7.4.2 Responsibility in Design

Responsibility is an important and enduring theme for industrial design.

One aspect of responsibility is sustainability, which is concerned with minimising the impact of products through their entire lifecycle, from manufacturing processes to recycling and reuse of the product at the end of its life (Fiell & Fiell, 2000). This affects not only the design and manufacture of the products themselves, but also more broadly on commerce and society. While the pioneering industrial designers would have been proud of their role in stimulating mass production and consumption, in the contemporary environment mass-production by itself without consideration of the wider impacts of the product and its lifecycle is not seen as a worthy goal. This is evident in Burdek's definition of design noted in Section 3.4.1. (Burdek, 2005. p. 16).

There is a potential tension between the need to produce commercially successful products and the broader or long-term needs of society. Examples of these broader needs may include reducing the energy consumed by the product in use, or reducing the amount of packaging to reduce litter or landfill volumes. Longer-term needs might include design for disassembly and recycling. The design of mass-produced products must be tempered with a broader understanding of the implications of all the design decisions over the lifespan of the product – including the selection of materials and production processes. This implies two elements:

- The recognition that this is an important issue not just for industrial design but also for society;
- The desire on the part of the designer to 'make a difference'.

Keeley believes, based on his experience at *Doblin Group*, that designers as a group have some sympathy with this approach.

Designers are socially responsible, in the main, and quite concerned about the life cycles of the products they create... Give our culture another thousand years and maybe everybody will be like that. But in the meantime, designers are a little ahead of the pack. (Mitchell, 1996. p. 135)

Press and Cooper, however, feel that the sense of responsibility in the design profession is still latent, and "...that design has yet to realise its potential as a progressive and responsible agent of change that was promised throughout the twentieth century." (Press and Cooper, 2003. p. 9). The responsibility of design to society is easily subsumed in the relationship between design and industry, which places an emphasis on robust design and design research processes that identify short- and long-term implications of design decisions.

3.8 *Industrial Design and the Future*

3.8.1 Forecasting the Future

This study proposes that industrial design has a special relationship with the future. Designers explore the future to understand the parameters for where design and culture might head in the future, and bring tomorrow back to today in the form of the products they design. Through their ability to simulate, industrial designers make the future real and tangible.

It is a truism that the rate of technological change is increasing, and industrial design is both responsible for some of this change and has a role to play in directing it. The products that industrial design is contributing to will take time to travel through the product development process and be launched in the market. For example, designing and developing a new office chair or a car is typically a four-year exercise: a commitment that cannot be taken lightly by any manufacturer. Any design project of this scale is a risk. Peter Schwartz (an advocate of the use of scenarios as a design tool) describes both this aspect of design and the need to take what he terms 'the long view' when approaching design projects:

Life is full of both threats and opportunities. My view is that, particularly given the circumstances we're now experiencing, if we fail to think adequately about those in advance we'll be unprepared to recognise them and take advantage of opportunities that are

emerging. And/or we'll be overwhelmed by risks that are evident out there. So we often today regret decisions in that past. We can see this acutely in business – probably in our lives, but certainly in the work of politics and business. We look back and say "Gee, I wish we had known this" or "I wish we had thought about that". It is precisely to avoid being in that position sometime in the future looking backwards that one takes the long view. (Mitchell, 1996. p. 141)

Industrial designers and industrial design processes, therefore, need to forecast the future – to take an informed guess at what is going to happen with a particular technology, what will happen to a new product, what 'next year's thing' will be, what the needs of consumers will be within the lifespan of a proposed product. In order for designers to understand the implications of decisions that they make about both the way that their products are used and the impact that product will have on the manufacturer, society and the environment, they have to explore the future. C. Thomas Mitchell notes in an introduction in his book *New Thinking in Design* that:

One of designers' laments is that they are compelled in their work to anticipate the future and embed that vision in form. Not surprisingly, designers often guess wrong. (Mitchell, 1996. p. 111)

When it comes to predicting the future, designers are just like any other group – there are hits and misses. However, design is attempting to *understand* the future not to *predict* it, which is not necessarily the same thing. Industrial design and industrial designers need to understand the possibilities, potentials, and pitfalls in their work. Donald Norman notes:

...I have concluded that it is impractical to try to predict the impact of any new technology. The best we can do is be flexible so that people can use new technologies in unexpected ways. (Mitchell, 1996. p. 98)

An understanding of the relationship of industrial design with the future throws another light on the role of industrial design.

3.8.2 What is the role of industrial design?

Design theoretician Bryan Lawson argues that the role of industrial design is to create elements of the future.

Unlike scientists who describe how the world is, designers suggest how it might be. Designers are therefore all 'futurologists' to some extent. The very essence of their job is to create the future, or at least some features of it. (Lawson, 1997. p. 113)

Another view of the role of industrial design comes from British engineer and businessman James Dyson, creator of the *Dyson* vacuum cleaner, who describes the role of the designer and engineer:

We don't try to discover what people want before we go out and develop a new product - not at all. People don't necessarily know what could be possible - why should they? That's what engineers and designers are for. (Dyson, cited in Muranka & Rootes, (1997. p. 20))

Explicit in this statement is the idea that lay people can't anticipate what new technologies might be able to deliver, and that the role of the designer is to connect the needs of the market with what is technically possible. This casts industrial design in the role of mediator, attempting to understand what users need and how those needs could be met by design and technology.

As a key concept, this study proposes that the role of industrial design and industrial designers is to *mediate between people and technology*, whether 'people' means one person (the user) or many (the producer(s), society). The discussion through this chapter has highlighted four areas where mediation is evident in industrial design processes:

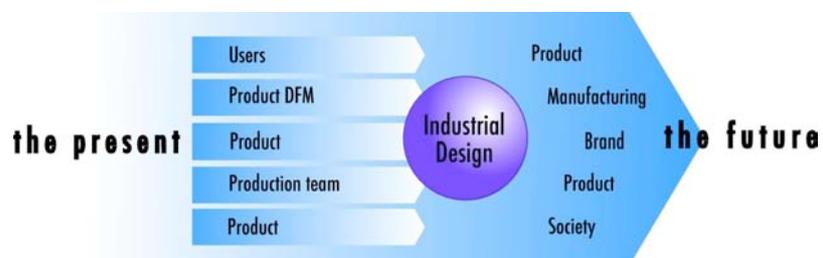
- Mediating between product technologies and users – designing products so that function and operation are intuitive, even if users do not understand the product technologies involved.

- Mediation is also implicit in the designer's role as synthesist in the product development process, balancing the needs of the variety of interests in the project.
- Design philosophy is the mediator between strategy, capabilities and brand (Ravasi & Lojaco, 2004).
- Designers may also need to mediate between the needs of the market and society at large – to resolve the tension between responsibility and consumption.

Responsibility has been discussed as an interest of industrial design, and in the role of industrial design as a mediator, it becomes clear that one of the aspects that industrial design has to mediate is the relationship between today and tomorrow. Industrial design must develop its sense of responsibility to minimise the impacts on the future of design decisions being made today.

Figure 3.14 shows five ways that industrial design and industrial designers may have to mediate between the present and the future.

Figure 3.14
Industrial design and where it
mediates between the present and the
future.



There are two examples of the role of the industrial designer as mediator.

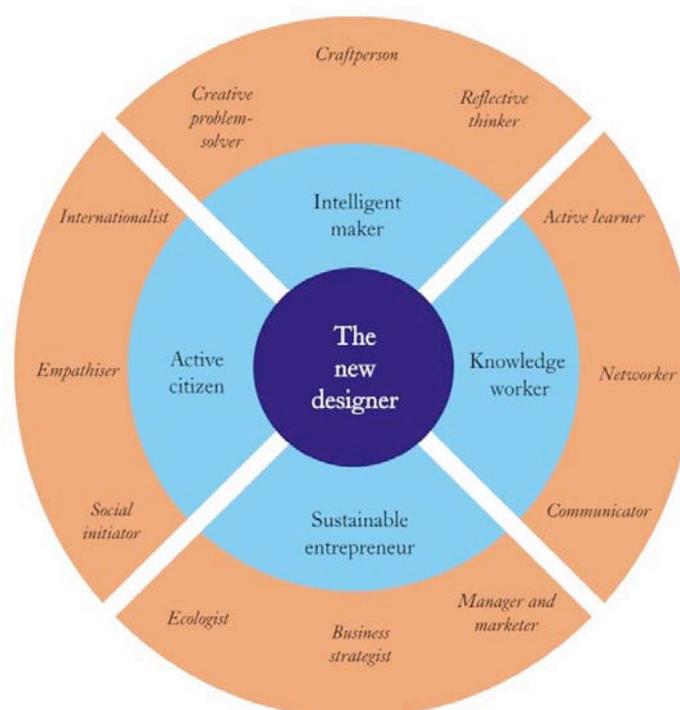
Press and Cooper argue that designers are "cultural intermediaries" – "Designers... play a vital role in helping people find meaning, identity and sense in a highly confusing world." (Press & Cooper, 2003. p. 32). They additionally propose the idea of 'the new designer', who they describe as having these four characteristics:

- Intelligent maker;
- Active citizen;
- Knowledge worker;

- Sustainable entrepreneur.
(Press & Cooper, 2003. p. 198).

These characteristics are further defined in Figure 3.15. It is clear that Press and Cooper's 'new designer' is very well rounded, and needs to manage a wide variety of information if they are to be able to perform their function as cultural intermediary. Implicit in this complex web of information that the new designer has to navigate through is the idea of mediation – balancing, weighing, and ultimately making a decision.

Figure 3.15
The new designer has many attributes and contexts between which they need to navigate and mediate.
(After Press & Cooper, 2002, p. 199)



Relevant to the context of this study, the second example that supports the idea of designer as mediator is 'Clarke's Third Law', stated by scientist and science fiction author Arthur C. Clarke:

Any sufficiently advanced technology is indistinguishable from magic.
(Clute and Nicholls, 1999. p. 765)

While Clarke's Third Law refers to science fiction ideas, the principle equally applies to the way that industrial design needs to interpret technology for those

using the end product. Contemporary products are complex objects, and it is evident that technical advances can render technological products completely indecipherable to those not technically inclined or disenfranchised by poor design. The video cassette recorder (VCR), for example, must be considered as being a mature product, having been on the market since the early 1980s. However, the interface has yet to be resolved to a point where the operation is intuitive for a wide range of users. To many users of everyday technology, the VCR is the face of Clarke's Third Law; a product that requires a magic touch to get it working. The replacement technology, the DVD recorder, exhibits similar shortcomings.

This study proposes that the role of industrial design is to mediate between people and technology, with a focus on minimising the impact on the future of decisions that are being made today. The best tools that industrial design has available to assist in this role are the use of forecasting and scenarios, coupled with the profession's sense of responsibility.

3.9 Summary

Industrial designers design products for industry. The vast majority of these products will be mass-produced.

Designers are primarily involved in the areas of the design process that focus on understanding the needs of the user in terms of product performance and product experience. Designers have a key 'ability to simulate' that positions them as a mediator in the design process. Industrial designers are interested in both product performance and product experience.

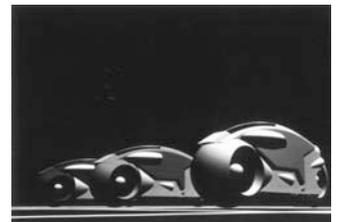
Industrial design is four things: product, process, profession, and activity. This highlights that industrial design is an important but not essential element in the product development process.

Definitions of industrial design reflect the state of concurrent design practice and also chart the increasing complexity of industrial design practice. The development of the area can be seen in terms of both 'intention' and 'perception'.

Good industrial design recognises a relationship between the product and its context. There are a number of possible contexts within which industrial design can be assessed.

Contemporary design practice includes design research methods that demonstrate the increasing maturity and confidence of the profession. Innovation, branding, and responsibility are key issues for industrial design.

This study proposes that the role of industrial design is to mediate between people and technology, with a focus on minimising the impact on the future of decisions that are being made today. Industrial design employs forecasting and its sense of responsibility as tools to assist in this role.



Chapter 4: Science Fiction

4.1 *Introduction to the chapter*

This chapter aims to establish a broad understanding of the key issues that characterise science fiction, and to address the two central study questions 'what is science fiction?' and 'what is the role of science fiction?' Rather than restate the work of others in describing science fiction, viewpoints that are often relatively narrow, a larger picture is drawn that both describes the breadth of the genre and examines key areas in some depth. In asking the same questions about science fiction as have been asked about industrial design, it lays the groundwork for the subsequent chapter comparing industrial design and science fiction.

In the previous chapter, a clear connection was drawn between industrial design and the *future*. This second aim of this chapter is to draw a clear connection between science fiction and the *present*, particularly to identify the role of science fiction.

This chapter describes what science fiction is and discusses its scope, themes, intent, and function as a genre. It analyses the varying perceptions of science fiction from inside and outside the genre, and identifies the stereotype of science fiction. The chapter also discusses the outcomes and processes of science fiction, briefly explores the culture of science fiction, and examines two concepts that are relevant to the genre. It acknowledges the difficulty of defining science fiction. There is a condensed thematic analysis of the development of science fiction, and a review and discussion of what constitutes 'good' science fiction. The chapter evaluates several issues that characterise contemporary science fiction, and the final section discusses the relationship between science fiction and the present.

Like the previous chapter, this chapter is largely based on the material from the literature review. Some analysis in this chapter uses the 'perception/ intention' and 'impression/sensation' models to discuss the development and understanding of science fiction.

Several works of science fiction (novels, films and television) are used in the text as examples of specific issues. A description of the work, and how the issues are evident is included in *vii. Science fiction works used as examples in the text*. Other works are noted in the text, but their relevance does not require expansion.

4.2 *Literature Review*

4.2.1 Introduction to the literature review

It might be expected that as a genre, and therefore of interest to a relatively narrow band of people, structured analysis of science fiction would be slim. In fact science fiction has been thoroughly explored from almost every conceivable direction.

Science fiction writings encompass a wide range of approaches, but generally do so in isolation – few publications reflect the sheer breadth of the genre. Science fiction has been frequently approached with a focus on one or other of its different media: books, periodicals, movies, and so on. The vast majority of this material is intended to communicate or analyse something about science fiction and science fiction ideas. This body of material has been of significant use to this study, although the ideas are not directly related to the relationship between science fiction and industrial design.

Science fiction has been explored through the avenues of cultural theory, film theory, queer theory, and feminism. These approaches use ‘readings’ – an observer-driven discussion of themes seen in the original work - as a tool to explore other ideas relating to culture. Generally, these writings have been less useful to this study.

Many publications on science fiction cinema spend some time discussing science fiction generally to establish the context for analysis. These discussions have proved to be useful, partly as they are focussed on science fiction cinema, and partly as the discussions are generally clearly structured.

Science fiction thrives on the Internet, with thousands of special interest websites devoted to movies and television shows in particular. Much of this material is based in fan culture and is less relevant to this study. There are, however, a small number of commercial sites that reflect the breadth of contemporary science fiction better than any other resource.

The body of work about science fiction breaks down into several broad areas:

- Introductions to the genre;
- Overviews (not always the same thing as an introduction);
- Chronological or thematic histories;
- Science fiction media: literature, illustration, cinema, television;
- Histories, or discussions of specific works or people;
- Biographies;
- Fan culture;
- 'How to' guides (on generating your own science fiction).

The literature review looked for answers to the central study questions:

1. What is science fiction?
2. What is the role of science fiction?

In doing so, it focussed on assembling specific information that could connect science fiction and industrial design.

Biographies and fan culture generated little of direct interest to this study, and there is only passing mention of these themes.

4.2.2 Key Texts

- *The Encyclopedia of Science Fiction* (Clute & Nicholls, 2nd edition, 1999)

The second edition of *The Encyclopedia of Science Fiction* by John Clute and Peter Nicholls is literally and figuratively the heavyweight in the field and could be considered the standard reference work on science fiction. Running to 1398 pages in paperback, *The Encyclopedia of Science Fiction* is an extensive catalogue of people, places, things, events, history, themes, ideas, books, films, stories, programmes, and concepts related to the genre, and the

Encyclopedia is comprehensive to the point of being almost exhaustive. However, in the context of this study it is interesting to note that Clute and Nicholls generally consider science fiction cinema as a less important medium than literature, on the basis that cinema is a poor medium for expressing ideas. Generally, however, for a grounding in many of the ideas centred on science fiction, this publication is the first port of call and has contributed to every part of this chapter as well as Chapters 5 and 6.

- *The Science Fiction Book - An Illustrated History* (Rottensteiner, 1975)

Despite its age, Franz Rottensteiner's *The Science Fiction Book* has been a valuable text for this study based on the breadth of material that it covers. While Clute and Nicholls describe the book as "sketchy" (Clute & Nicholls, 1999. p. 1031), it exhibits some depth in addition to the range of material that it covers. This is one of the few books to identify contributions to science fiction from parts of the globe other than America and Britain. The book is generally chronological in structure, but engages with many themes through its discussion of the development of science fiction and the ideas behind the genre. The themes and the breadth of the discussion have contributed to the understanding of the genre, as well as the themes in its development discussed in this study.

- *Sci-Fi Weekly*, www.scifi/sfw.com

The Sci-Fi Weekly website is a part of NBC Universal Television's Sci-Fi Channel cable television channel based in the United States. It could be expected that the website would focus largely on science fiction on television, but it covers a wide range of media including screen (both television and cinema), books, anime¹, games, sound (usually soundtracks to movies), science fiction classics from all media, and what the website describes as 'cool stuff' (mostly toys). The reviews are literate, scholarly, and generally more perceptive than might be expected. There are regular contributions from a number of columnists including John Clute (co-editor of the *The Encyclopedia of Science Fiction*) and scientist Will McCarthy. The value of this website is in

¹ *Japanese animated movies and television programmes*

the depth of understanding evident in much of the material, and in the snapshot that it presents of contemporary science fiction in terms of ideas, media and culture.

Science Fiction Media

- *Science Fiction Film* (Telotte, 2001)

Telotte's broad approach to science fiction cinema is particularly useful in encompassing a variety of viewpoints.

The book is broken into three parts. The first discusses the nature of science fiction and science fiction film, and identifies a number of possible critical contexts within which the genre can be discussed. Telotte provides a useful model for this study, as he confirms that the same medium can be approached from a variety of directions, leaving open the possibility of 'reading' science fiction film from an industrial design viewpoint. Contexts that Telotte identifies include humanism, feminism, and postmodernism.

The second part of the book looks specifically at the trajectory of American science fiction film, based on a chronological / thematic analysis of the relationship between film and other science fiction media. The third part of the book looks in detail at specific films in terms of ideas identified through the discussion on science fiction film in general. This is effectively a case study approach, and has additionally been influential in providing an example for the analysis of science fiction film in terms of its production design (see Section 6.5).

- *Screening Space: The American Science Fiction Film*. (Sobchack, 1987)

Screening Space is seen as a standard work of film studies in the area of science fiction, and is of value to this study for two reasons. First, this is another work that discusses what science fiction is before exploring the genre. Sobchack's range of definitions identifies the experiential model explored in Section 4.4.2.

Secondly, *Screening Space* contains a chapter that is the closest thing to a discussion of science fiction cinema and design found in the literature review. 'Chapter 2 – Images of Wonder: The Look of Science Fiction' discusses many issues which cross over into industrial design, but it is not the intent of the author to engage with design ideas, and so any connections relevant to this study must be extrapolated from the text. Sobchack is interested in the role that the narrative creates for the object rather than how that role is created by the design of the object itself. For example, spaceships are identified as 'hostile', 'neutral', or 'optimistic' depending on their role in the narrative, rather than recognising the nature of the spaceship as a designed object. Sobchack also exhibits a relatively narrow focus in her writing when she generically describes 'neutral' spaceships (those whose function in the film is merely to get people from A to B) as having "about as little visual impact and iconic power as a Greyhound bus." (Sobchack, 1987. p. 71). While her intent in this phrase is clear, Sobchack picks an unfortunate example, as at least one Greyhound bus was designed by Henry Dreyfuss and has some iconic power within a design context.

Sobchack states at one point:

...the SF film attempts to meet our expectations by using the magic of design and special effects cinematography to show us things that do not exist, things which are highly speculative, which astonish us by the very fact of their realization on the screen since they have no counterparts in the world outside the theatre. (Sobchack, 1987. p. 91)

Having got this close to design ideas, it is not within the scope of Sobchack's work to investigate the nature of the 'things' themselves except in the very broadest sense. Ultimately, *Screening Space* provides only a glimpse of the role of design in science fiction cinema, but there are still ideas that appear in this study.

- *The Aesthetics of Ambivalence: Rethinking Science Fiction Film in the Age of Electronic (Re)Production* (Landon, 1992)

Landon's writings are one of the few examples where a strong thread of ideas can be seen that could be woven into a relationship between science fiction and industrial design. While Landon acknowledges that Sobchack influences his writing, his approach to science fiction film is quite different. Landon is clearly enthusiastic about science fiction and film, whereas Sobchack is more interested in reading science fiction film as a genre and tying it to American culture. *The Aesthetics of Ambivalence* is another book that needs to discuss science fiction before it can focus on cinema, and contains valuable material in this introductory section.

There are several themes in Landon's book. One is the relationship between science fiction literature and film: he identifies a high level of antipathy to science fiction film on the part of science fiction literature, and explores why film and literature as science fiction media are so different. His other interest is in the relationship between science fiction film and cinematic special effects. Overall, Landon writes from an academic viewpoint that manages to recognise the wide variety of conceptual and pragmatic issues that impact on science fiction cinema. In this respect, *The Aesthetics of Ambivalence* is a key reference for this study, not only in subject but as a model that shows how different ideas and concepts can be structured, analysed and reconciled.

- *Alien Zone 1* (Kuhn (Ed.), 1990)
- *Alien Zone 2: The Spaces of Science Fiction Cinema* (Kuhn (Ed.), 1999)

These books are focussed on science fiction cinema, but are works of cultural theory, and (as noted in Section 4.2.1) read science fiction films from a specific critical context, constructing arguments within this context using material from films as examples. The *Alien Zone* books are collections of essays. The most interesting single chapter is by Scott Bukatman in *Alien Zone 2: 'The artificial infinite: on special effects and the Sublime*. This particular aspect is explored further in Chapter 6 as well as in this chapter.

- *Unearthly Visions: Approaches to Science Fiction and Fantasy Art.*
(Westfahl, Slusser & Plummer (Eds.) 2002)

Unearthly Visions is a collection of essays about science fiction and fantasy art and illustration. While it is curious to see a publication that focuses on illustration without containing a single image, the Introduction by co-editor Slusser and the three subsequent chapters contain ideas useful to both the history of science fiction and the imagery it employs. Westfahl's alternative approach to the history of science fiction, based on the role of science fiction illustration and the relationship between illustration and narratives, is particularly useful. The influence of this approach is evident in this study. Plummer identifies what she sees as a cause and effect relationship between science fiction cinema and illustration and the Moderne architectural style. A third chapter on the aircraft termed the 'flying wing' (a favourite of both science fiction and industrial design) by Howard Hendrix contains insights on streamlining and science fiction narratives. Many of these ideas appear in this chapter.

4.3 *What is Science Fiction?*

4.3.1 Scope

At its best, SF is the medium in which our miserable certainty that tomorrow will be different from today in ways we can't predict can be transmuted to a sense of excitement and anticipation, occasionally evolving into awe. Poised between intransigent scepticism and uncritical credulity, it is par excellence the literature of the open mind.
(Brunner, cited in Gökce, 1996 www.panix.com/~gokce/sf_defn.html)

"That's starting to sound like science fiction."

"You live on a spaceship... dear".

(Whedon, 2002)



Figure 4.1
Amazing Stories, August 1932: the stereotype of science fiction: alien invasions and rayguns.
University of Liverpool
http://www.liv.ac.uk/images/newsroom/press_releases/2005/04/Amazing%20Stories,%20Aug.jpg

The second quote is a clever in-joke from one of the characters in the television series *Firefly*, and reflects at several levels what many people feel about science fiction: that it has little relevance to the real world. By contrast, science fiction author John Brunner clearly sees something in science fiction that inspires him personally, and believes that the genre has something to offer the world. The stereotype of science fiction is of a marginalised genre that appeals to nerds who spend their lives in front of computers eating pizza. But what is science fiction, how does the genre work, and most importantly, what does science fiction do?

A character in Karen Joy Fowler's 2005 mainstream novel *The Jane Austen Book Club* expresses her misgivings about science fiction in a conversation with another character who admits to reading the genre:

She didn't actually have to read science fiction to know what she thought of it. She'd seen Star Wars.

... "I like books about real people," Jocelyn said.

I don't understand the distinction."... "Elizabeth Bennett² is a real person but people in science fiction books aren't?"

"Science fiction books have people in them, but they're not about the people. Real people are really complicated" (Fowler, 2005. p. 173)

What the character is saying is that her understanding of science fiction is that it's not literature; that her experience of the movie *Star Wars* (dir. Lucas, G. 1977), with its monomythic characters, rayguns and spaceships, is all there is to science fiction and that there is no value to further explorations of the genre. While there is some truth in the view that science fiction tends to value scenario over character, even a cursory analysis of science fiction texts shows a wide variety of themes and means of expressing those themes.

The stereotype is that science fiction contains lots of spaceships and Bug Eyed Monsters (known as BEMs). 'Spaceships' implies an interest in science, technology, and the future (with a subtext of adventure and exploration) and these are certainly evident in much science fiction. These facets of science

² *Elizabeth Bennett is a character in Jane Austen's 1813 novel Pride and Prejudice.*



Figure 4.2

The icons of science fiction: *Star Trek's* star ship *USSN Enterprise* (Roddenberry, 1966).
<http://www.cloudster.com/Sets&Vehicles/STEnterprise/ent37.jpg>

fiction have generated many of its most enduring icons – the starship *USSN Enterprise* (from the 1966 television series *Star Trek*), rayguns, and light sabres (from the movie series *Star Wars*) among them. There really are bug-eyed monsters in science fiction: the existence of aliens in science fiction signifies both the need to relate aspects of the story to humanity, and the need for any decent story to have decent villains. However, science fiction is far broader in scope than stories of journeys in space and invasions by aliens.

An analysis of science fiction identifies three recurrent themes in its narratives. The most obvious is science and technology, particularly advances in these fields. The second is the notion of futures, some change from the world as we know it. The third is the inclusion of the human element, making explicit the concern that wherever science fiction goes it grounds its explorations in some relevance to humanity.

Narratives may be set in space, on Earth, somewhere else in the solar system or the galaxy, in the far future or the near future. They may travel in time between the past, present and the future, or live in alternative presents and alternative pasts.

Science fiction narratives are expressed through a variety of media. The core of science fiction is comprised of those areas where the primary intention is that the *outcomes* are science fiction – works that explore science fiction ideas and images (Landon, 1992). The main areas of science fiction are (in loose chronological order of development): literature, illustration, cinema, radio, and television. There are also areas where science fiction imagery and narratives are evident, but are not the prime focus. These include electronic gaming (arcade, personal computer, game consoles), toys, and comics and graphic novels. Science fiction is also evident in the peripheral areas of music videos and advertising, but this is limited to imagery only and rarely engages with any science fiction ideas (Landon, 1992).

Historically, published works have been the core of the genre. Science fiction ideas can be seen in written works dating back several hundred years, although there is some debate about how the development of the genre is best

charted (see Section 4.5). Science fiction cinema and radio are relative newcomers, although cinema has grown considerably and is now the most visible of the science fiction media.

Despite the impression that science fiction is a narrative genre, first and foremost it is considered a genre of *ideas*. Contemporary science fiction author David Brin describes science fiction as "*the literature of exploration and change*" (Haber, 2003. p. 186). This is supported by science fiction author Richard Salsbury:

...one thing is sure: somewhere, in each piece of sf, there is an idea - something that is outside the reader's normal world-view and which might even be completely new to them. (Salsbury, 2005, www.rsalsbury.co.uk/art_ideas.htm)

Salsbury further observes that the narratives themselves are not even always the primary reason for the existence of science fiction.

For some people, the idea content of a story is the most important - maybe the only important - thing. (Salsbury, 2005, www.rsalsbury.co.uk/art_ideas.htm)

This focus on the investigation of ideas has generated a body of science fiction where ideas are valued for their novelty.

Telotte identifies a basic tension between the terms "'science' and 'fiction', as *fact and fabrication*." (Telotte, 2001. p. 3). LeGuin describes the term science fiction as "*ungainly and inaccurate*" (Le Guin, 1996. p. 2). The 'science' in science fiction suggests that this is the primary narrative focus. However, despite the unequivocal nature of the term 'science', an analysis of science fiction shows that:

- 'Science fiction' defines a genre but not a focus;
- Science is as much a narrative vehicle as a thematic preoccupation;
- 'Science' overlaps and is frequently interchangeable with 'technology';

- The scope of science fiction includes changes in science and technology but more broadly any change in the social or technological fabric. This includes postulating ideas that have nothing to do with science and technology.

It is possible that one of the reasons science fiction has held fast to its name is that this differentiates the genre from its close cousins horror and fantasy.

While at the centre of these genres it is easy to clearly identify science fiction, horror and fantasy, it is in the overlaps between these genres that there are works that combine distinctive elements of the others. This is discussed further in Section 4.4.1.

Clute and Nicholls' *The Encyclopaedia of Science Fiction* (the major work on science fiction as a genre) lists around 125 distinct themes for science fiction stories (Clute & Nicholls, 1999. p. xxix). These themes include both styles (or sub-genres) and subject matter. Sub-genres that Clute and Nicholls identify include:

- Space opera: large-scale tales of action with lots of spaceships.
- Cyberpunk: centred on virtual realities and cyberspace.
- Hard science fiction: relies on a core scientific or technological content.
- Steampunk: contemporary events are set against a 19th Century background.
- Dystopias: dire consequences of technological or sociological changes.

Subjects include the obvious:

- Time travel: more a story device than a prediction, time travel is an enduring theme in science fiction.
- Faster than light: exploring (or finding a way around) the complications of Einstein's Theory of Relativity.
- Aliens: as both friends and antagonists.
- End of the world: a popular theme during the Cold War.
- Alternate worlds: often look at crucial points in history and speculate what the world would be like now if things had unravelled differently.

And the not so obvious:

- Atlantis: a symbol of the fall of man.

- Apes and cavemen (in the human world): typically used as a metaphor for innocence as they try to engage with our corrupt world.
- Big dumb objects: these are vast objects usually abandoned long ago by alien races, and used as a background to 'why are we here?' narratives.
- Invisibility: usually employed as a cautionary story device.

Overlaid across these narrative themes are different intents for science fiction. Science fiction can be fantastic, provocative, predictive, metaphorical, lyrical, satirical, purely entertaining, or any combination of these. Some science fiction outcomes aim to be genuinely predictive, while others eschew prediction, or any sense of reality, for pure entertainment. As a science fiction author, Le Guin views science fiction as a 'tool':

And what is science fiction at its best but just a 'new tool' as Mrs. Woolf³ avowedly sought 50 years ago, a crazy, protean, left-handed monkey-wrench, which can be put to any use the craftsman has in mind—satire, extrapolation, prediction, absurdity, exactitude, exaggeration, warning, message-carrying, tale-telling, whatever you like—an infinitely expanding metaphor exactly suited to an expanding universe, a broken mirror, broken into numberless fragments, any one of which is capable of reflecting, for a moment, the left eye and nose of the reader, and also the farthest stars shining in the depths of the remotest galaxy? (LeGuin, cited in Lavery n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

While many forms of fiction share these aims, the two core characteristics that define science fiction are the overlapping but distinct issues of *anticipation* and *interrogation*. While these ideas are generally acknowledged as characteristics of science fiction, these terms are specific to this study and are applied in a way that assists in the connection of industrial design and science fiction.

The focus of science fiction has broadened from a position of relatively naïve, unquestioning fascination with the immediate possibilities of new technologies (readily apparent in the earliest genre fiction from the first half of the twentieth

³ British author Virginia Woolf

century) to a fascination with the consequences of the use of new technologies evident in much contemporary science fiction. There is a constant interrogation of the *morality* of these developments. The scope of science fiction is such that these two positions – fascination and interrogation - coexist side by side, despite the apparent conflict between the two. High-profile director Stephen Spielberg's science fiction movie *Minority Report* (2003) exhibits the dichotomy in this position by foregrounding technological and design developments as part of the *mis en scene* while the narrative of the movie questions the morality of one specific development. This is similar to the tension evident in the relationship between industrial design and commerce.

Perhaps the most succinct comment on these two intents come from science fiction author Arthur C. Clarke:

I don't try to predict the future – I try to prevent it. (Malik, 1980. p. 118)

Clarke's view encapsulates both prediction and interrogation in one sentence. Brunner also refers to these two aspects of science fiction in his definition of science fiction "*Poised between intransigent scepticism and uncritical credulity...*" quoted at the beginning of this section. American 'Grand Master of Science Fiction'⁴ Robert A Heinlein described his enthusiasm for the genre like this:

I think that science fiction, even the corniest of it, even the most outlandish of it, no matter how badly it is written, has a distinct therapeutic value because all of it has as its primary postulate that the world does change. (Heinlein, cited in Lavery n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

New York Times book reviewer Gerald Jonas wrote of how trivial he felt when faced with the September 11th 2001 attacks on the World Trade Centre in New York. In the face of disaster, he saw the need for a genre that could validate his vision, his hope for the future – his hope that there is a future.

⁴ An award conferred by the Science Fiction and Fantasy Writers of America

...I felt all the more certain of the importance of a genre rooted not in here-and-now reality but in untrammelled imagination - a literature free to stand apart from the specifics of today and speak about who we are and who we might be with daunting clarity. (Jonas, 2001. <http://www.nytimes.com/2001/10/07/books/07SCIFIT.html>)

This sense of relevance on the part of science fiction fans has generated a strong sense of science fiction culture – an unusual and distinctive aspect of science fiction. Science fiction has, since birth, developed a fringe culture that is not only evident in the consumption of what might be termed mainstream science fiction but more spectacularly in science fiction’s fan culture, termed ‘fandom’ by the fans themselves (Clute & Nicholls, 1999). There is a significant - almost underground - culture that revolves around conventions and a fan level of science fiction creation that includes writing, filmmaking, criticism, game / role playing, modelling, and illustration.

4.3.2 Some Science Fiction Ideas

As a genre of ideas, science fiction has several key concepts that are used to describe the ideas and intents of the genre. Two of the ideas that are relevant to this study are the overlapping concepts of *novum* and *subjunctivity*.

4.3.2.1 *Novum*

In an essay in his book *Fictional Space: Essays on Contemporary Science Fiction* (1991), University of Leeds Professor Tom Shippey describes science fiction literature as a “*high-information*” genre (Shippey, 1991. pg 15). To illustrate this point, Shippey compares extracts from a science fiction and a non-science fiction novel, both describing a man preparing to leave home for work in the morning. Both extracts function as an introduction to the character and their world. The removal of every third word from each extract leaves the non-science fiction situation still understandable – the likely meanings of the missing words can be intuited from the context and the familiarity of the situation. By contrast, the science fiction extract becomes almost unreadable owing to the number of new things that are outside the experience of the reader.

This demonstrates the degree to which science fiction relies on innovation. In the science fiction context, Shippey describes these bits of new information as *novum* (from the Latin, “the new thing”): “a discrete piece of information recognizable as not-true, but also as not-unlike-true, not-flatly- (and in the current state of knowledge) impossible” (Shippey, 1991. p. 9).⁵

In any given science fiction narrative, there are both big and little ideas that are fresh and innovative, things outside our experience. These bits of data are the key elements of science fiction and are a distinctive characteristic of the genre.

The concept of *novum* is critical to this study, as it connects very strongly with the concept of innovation in industrial design, and breaks science fiction down into its simplest element: the new idea.

Sobchack (within the context of science fiction film) describes the effect that *novum* has:

...here is the expectation we all have of SF film – that it show us things we’ve never seen before, that it move us beyond the confines of the known. (Sobchack 1987. p. 89)

Curiously, Clute and Nicholls’ *Encyclopedia of Science Fiction* makes no mention of *novum*, so the visibility of the idea must be considered of limited importance to science fiction.

4.3.2.2 Subjunctivity

If the *novum* is the new idea, *subjunctivity* describes just how new the idea is – how inventive, innovative or science fictional. Samuel Delany – a prolific critic and author of science fiction – defines *subjunctivity* as:

... a peculiar compromise between reality and unreality, truth and untruth. The degree to which every statement in SF describes a hypothetical condition: something that is not happening, has not

⁵ Shippey credits the idea to Darko Suvin (1979)

happened, could not have happened in the past, but might happen, given the proper changes in society and scientific knowledge. Also known as the “if-ness” of science fiction, the condition of being contingent. (Delany, cited in Duncan, 2005.

<http://notesfromthegEEKshow.blogspot.com/2005/12/sf-considered-as-subset-of-sf.html>)

The idea of subjunctivity crosses over with the concept of novum, but adds a degree of definition – how daring, how innovative, outside the square is this? Like novum, subjunctivity is of value to this study as it enables some measure or description of science fiction ideas.

4.3.3 Levels

This study proposes that science fiction, therefore, has four levels:

- Ideas: the ideas about science and technology, change and humanity that are woven into narratives;
- Processes: the way that these ideas are developed and expressed;
- Products / media: the places where science fiction narratives are expressed;
- Culture: the culture that has developed based on both producing and consuming science fiction.

These levels are shown in Figure 4.3.

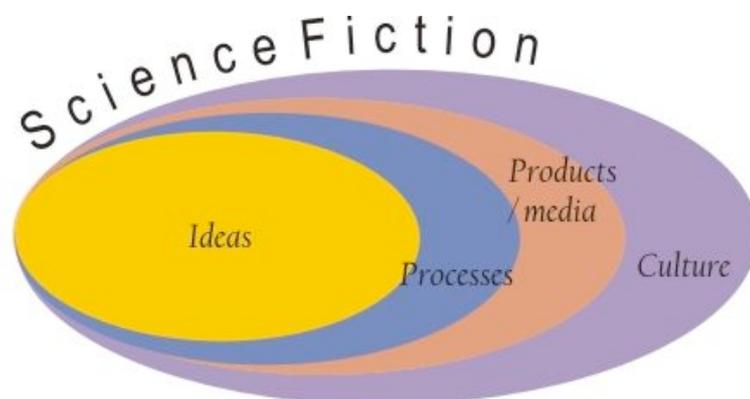


Figure 4.3
Levels of science fiction.

4.4 Defining Science Fiction

4.4.1 Overlaps

While describing science fiction is relatively straightforward, defining the genre is an exercise that has caused much debate. On the surface, identifying science fiction is easy – the presence of icons or nova such as spaceships, virtual realities, robots and rayguns in a novel or film more or less guarantees that it's science fiction. There are different levels of subtlety in the presentation of the ideas, but the core science fiction ideas are usually clear.

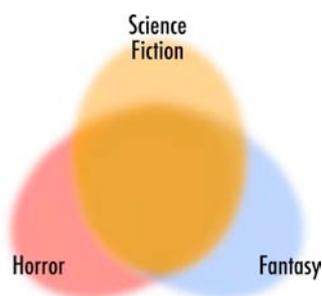


Figure 4.4

The triadic relationship between science fiction, horror, and fantasy. The blurred boundaries suggest that the margins between the three areas are hard to define.

However, the genre typically employs elements from other forms that make clear distinctions difficult if not impossible in some situations. The inclusion of a thriller, action, romance or detective component is not special to science fiction and happens in other genres, but the core confusion – the one that seems to generate a substantial debate - is science fiction's overlapping, triadic relationship with fantasy and horror; a relationship that is based not only on a similarity of subject but also of form (Telotte, 2001). (Figure 4.4)

Science fiction's central conceit – the core aspect that separates it from fantasy and horror – is that it is only one or two steps removed from reality through its themes of science and technology. However, the nature of the science fiction / fantasy / horror triad makes it inevitable that elements of each will appear in narratives that have overtly different intents. Like science fiction, fantasy and horror also rely on distinctive ideas - magic allied with the allure of the primitive on the part of fantasy, the fear of the unknown and invasion of the body on the part of horror (Telotte, 2001). This ambiguity of subject appears to create a need for science fiction people to define their genre as standing distinct from both horror and fantasy.



Figure 4.5

Frankenstein's monster (from the 1931 movie *Frankenstein*, dir. Whale): exhibits aspects of both science fiction and horror. *Dr. Macros high quality movie scans* [http://www.doctormacro.com/Images/Karloff,%20Boris/Karloff,%20Boris%20\(Frankenstein\)_01.jpg](http://www.doctormacro.com/Images/Karloff,%20Boris/Karloff,%20Boris%20(Frankenstein)_01.jpg)

There are many examples of the cross-pollination of ideas between the three genres of science fiction, fantasy, and horror. From one viewpoint, the monster created by Frankenstein, the archetypal mad scientist in Mary Shelley's 1818 novel *Frankenstein: A Modern Prometheus*, is a central character in the first real science fiction story, but the monster has subsequently slid sideways to

become a horror icon. His distinctive scars and visible fasteners are clearly linked with the invasion of the body that is a characteristic of horror, while his creation by electricity is equally clearly linked with technology and thereby science fiction. Also evident in *Frankenstein* are the moral issues that are characteristic of science fiction: the creation turns on its creator, and thereby sounds a warning about the responsibilities of science and scientists (Rottensteiner, 1975).

4.4.2 Definitions

Evidence for the depth in the debate over what science fiction is defined as is visible in virtually every history or commentary on the genre. A typical approach to defining science fiction – evident in virtually every history or critique of the genre – is to review existing definitions, discuss their shortcomings, and propose a new variation. Aldiss (1973), Rottensteiner (1975), Suvin (1979) and Disch (2000), are examples of this approach.

As an illustration of the breadth of the debate, Neyir Cenk Gökce (1996. www.panix.com/~gokce/sf_defn.html) and Dr. David Lavery (n.d. <http://mtsu32.mtsu.edu:11909/305/Accessories/305OnlineSFDefinitions.html>) have collated a number of definitions of science fiction from critics and authors. Analysis of these definitions shows a number of recurring approaches to defining science fiction, from inclusive approaches - that explore the effects and aims of the genre - to more exclusive approaches that attempt to distance science fiction from horror and fantasy (its close cousins). Some definitions are intended to be purely descriptive, while others are more prescriptive or exclusive.

This definition comes from Theodore Sturgeon, an American science fiction author noted for his romantic novels set in space:

A science fiction story is a story built around human beings, with a human problem and a human solution, which would not have happened at all without its scientific content.

(Sturgeon, cited in Rottensteiner (1975. p. 8))

Sturgeon's view explicitly includes science and focuses on the human element, implying that the science is a critical vehicle for the exploration of human issues.

Many definitions are insistent that science is an essential element of science fiction. Editor H. Bruce Franklin's definition identifies science and technology as a key aspect of the genre:

In fact, one good working definition of science fiction may be the literature which, growing with science and technology, evaluates it and relates it meaningfully to the rest of human existence. (Franklin, cited in Lavery, n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

Author Robert Heinlein, who trained as a chemist, is also an advocate of the relationship between science and science fiction narratives:

Realistic speculation about possible future events, based solidly on adequate knowledge of the real world, past and present, and on a thorough understanding of the nature and significance of the scientific method. (Heinlein, cited in Lavery, n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

Science fiction author Miriam Allen de Ford's definition is broader in scope and is obviously aimed not only at succinctly defining science fiction but at defining the genre in relation to fantasy.

Science fiction deals with improbable possibilities, fantasy with plausible impossibilities. (Miriam Allen de Ford, cited in Aldiss (1973. p. 8))

De Ford's term 'improbable possibilities' suggests that science fiction focuses on things that are at least possible. While this is open to argument (faster-than-light space travel, for example, is a staple of science fiction but is impossible as far as many scientists are concerned) it does illustrate some distinction

between science fiction and horror / fantasy. Atteberry comments on this aspect of science fiction:

What SF is contingent upon is change that does not violate the reader's understanding of scientifically defined reality, which is not to say that we necessarily accept any statement in the text as scientifically valid. Rather, we accept reference within SF as allusions to science, broadly conceived of as a field of endeavor, a way of mapping the universe, and a way of speaking about the universe and the attempt to comprehend it.

(Attebury, cited in Lavery, n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

This is a more realistic way of understanding what the science in science fiction means: it is used as a vehicle and a means of expression.

The depth of the discussion around defining science fiction has generated an alternative approach that attempts to sidestep the debate entirely. This subset of definitions takes an experiential approach.

Hard to define abstractly, science fiction is instantly recognisable on the printed page. (Clarens, cited in Sobchack (1987. p. 20))

Science fiction is what we point to when we say it.

(Knight, cited in Lavery, <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)



Figure 4.6
Star Wars: gives the impression of science fiction. *Movie Gazette*
<http://www.movie-gazette.com/cinereviews/gallery.asp?id=918&img>

Damon Knight's definition has caused much debate, and while Vivian Sobchack describes Clarens' definition as "*feeble*" (Sobchack, 1987. p. 19), there is a seductive simplicity in this approach. These experiential definitions can be seen as a reaction to the debate over definitions itself, but what both Clarens and Knight are suggesting is that it is the *perception* that is critical – what might be termed the feeling or sensation of science fiction.



Figure 4.7
Minority Report: gives both the impression and sensation of science fiction. University of Reading
<http://www.rdg.ac.uk/fd/images/Minority%20Report%2002.jpg>



Figure 4.8
K-Pax: gives the sensation of science fiction. Covercomoz.
http://www.covercomoz.com/cover/FR023/K-pax_av-flabada.jpg

For example, the *Star Wars* movies give the impression of being science fiction. There are the expected nova of spaceships, ray guns, and other artefacts of an advanced technology, but the story would be materially unchanged if the spaceships were replaced with covered wagons and the rayguns replaced with Colt 45's. The level of subjunctivity in the narrative is not high. Names, distances and modes of travel might differ, but the story would be essentially unchanged. *Star Wars* is as much Western as science fiction, and exhibits strong traces of the monomyth, an old story in new clothes. By contrast, *Minority Report* both gives the impression of science fiction and the sensation of science fiction – its story is based solidly on science fiction ideas, and explores the implications and impact of many different technical and social developments as part of the fabric of the story. There are many new ideas in this movie, and the level of subjunctivity is very high in both the *mis en scene* and the narrative. By further contrast, *K-Pax* (dir. Softley, 2001) looks nothing like science fiction. There are no rayguns, BEMs or spaceships, but the movie gives the sensation of being science fiction in the way that it questions and dislocates both the viewer and the characters.

There are other definitions that take a broader approach and are less dogmatic about what is excluded. Author, critic and academic James Gunn has contributed this definition:

Science fiction is the branch of literature that deals with the effects of change on people in the real world as it can be projected into the past, the future, or to distant places. It often concerns itself with scientific or technological change, and it usually involves matters whose importance is greater than the individual or the community; often the civilization or the race itself is in danger. (Gunn, cited in Lavery, n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

In terms of this study, it is not necessary to either choose the most appropriate definition or to propose a new one. Directionally, the broader definitions (such as Gunn's, above) are more inclusive and recognise that the boundaries of the

genre are difficult to define. The impression / sensation approach, however, is potentially useful for a number of reasons and will appear later in this study.

4.5 *History and Development*

The development of science fiction has been discussed thoroughly, and there is little point in recapitulating that material here. However, it is valuable to highlight some of the issues and themes that characterise science fiction through a discussion of its history.

There are two models of the development of science fiction. In his book *Billion Year Spree*, science fiction author and critic Brian Aldiss (Aldiss, 1973) argues that science fiction originated with Shelley's 1818 novel *Frankenstein; or The Modern Prometheus*. Aldiss characterises the genre as a Gothic or Post-gothic literature, based on his view that "*Gothic's brooding landscapes, isolated castles, dismal old towns, and mysterious figures*" applies to science fiction (Aldiss, 1973. p. 20). This viewpoint is possibly influenced by the nature of concurrent science fiction, which at the time Aldiss wrote his description was exploring dystopias and the possible dire effects of ecological damage. While Shelley's novel was written as allegory rather than science fiction, it does exhibit many of the genre's preoccupations and modes, including technology out of control (Frankenstein's use of electricity to animate his monster) and the moral ending with the monster turning on its maker.

Aldiss' view aligns with Claren's definition of science fiction noted in the previous section: i.e. that science fiction originated with Shelley as her novel *looks like* or is *perceived as* science fiction. Subsequent authors working in the field of what we would now call science fiction include Jules Verne (*20,000 Leagues Under the Sea*, 1872), H.G. Wells (*The War of the Worlds*, 1898), and Edgar Rice Burrows (*A Princess of Mars*, 1912). Aldiss' articulate view of the development of science fiction has been influential in the science fiction community.

Garry Westfahl proposes a second approach to science fiction history, suggesting that the genre started in the early 20th Century in publications such as Hugo Gernsback's *Amazing Stories*.

...science fiction is best regarded as those texts that emerged from an understanding of the idea of science fiction... (Westfahl, in Westfahl, Slusser & Plummer (2002. p. 20))

Gernsback was the first person to systematically advocate the combination of narrative with the description of scientific and technological developments through his editorship of the pulp magazine *Amazing Stories*. While the term that Gernsback coined was the rather clumsy 'scientifiction', he is acknowledged as the 'father' of science fiction (Rottensteiner, 1975).

By 'scientifiction' . . . I mean the Jules Verne, H. G. Wells, and Edgar Allan Poe type of story - a charming romance intermingled with scientific fact and prophetic vision. (Gernsback, cited in Lavery, n.d. <http://mtsu32.mtsu.edu:11090/305/Accessories/305OnlineSFDefinitions.html>)

The difference between Shelley's *Frankenstein* and the works published in *Amazing Stories* was that Gernsback promoted the *idea* of science fiction: his *intention* was to create science fiction, while Shelley's work is only recognised as science fiction with the benefit of hindsight.

While this is a relatively academic distinction, these two approaches to science fiction history – the *idea* as distinct from the *perception* – is a theme of value to this study as it sidesteps much of the debate about what science fiction is.

These alternative approaches also highlight another issue relevant to this study. Science fiction is occasionally described as an essentially American genre (Sobchack, 1987, Disch, 2000) to the ire of the remainder of the science fiction world. The debate is fuelled by the sheer visibility of much American-centred cinema and television SF output. Certainly, the American preoccupation with technology is evident in science fiction, and the *intention* or

perception model of the development of the genre also suggests a division between America and the remainder of the world. The *intention* model is firmly grounded in American history and culture, while the *perception* model acknowledges influences and roots across the globe.



Figure 4.9
Méliès's *Le Voyage Dans la Lune* (1902): early experimentations with special effects employed science fiction themes around which loose narratives were constructed. (Kyle, 1976. p.45)

Some of the earliest fictional movies, such as Georges Méliès' 1895 *La Lune à un Mètre* (*The Astronomer's Dream*), told a story with a science fiction theme, but relied heavily on the novelty of capturing motion to entertain as opposed to the establishment of narrative (Rickitt, 2000). Méliès' satirical 1902 production *Le Voyage Dans la Lune* (*A Trip to the Moon*) is widely regarded as the first 'significant' science fiction production, owing to its running time: 21 minutes as opposed to the then typical one- or two-minute productions (Landon, 1992). These earliest science fiction movies presaged the science fiction movie stereotype of spectacle over content, not only capturing motion but – critically – exploring and celebrating the possibilities of what have become known as 'special effects' (Landon, 1992). However, Méliès' productions were accidentally science fiction, and are part of the history of the perception of the genre.

The sharp growth of the arena during the 1930s and 40s - termed the 'golden age' of science fiction - has left a strong legacy on both the practice and perception of science fiction (Rottensteiner, 1975). In the rush to explore the huge conceptual possibilities of the newly popular stream, many authors were possibly so excited about their 'fantastic' concepts that they neglected plots and characterisation. A clear example is the early work of Isaac Asimov: his *Foundation* series (1951, awarded a special Hugo award in 1966 as the 'best all-time series') (Rottensteiner, 1975) shows the promise of the genre in its broad and highly imaginative scope, but his thin and stereotypical characters restrict the appeal of the novels to enthusiasts only.

Science fiction – like many other cultural artefacts – reflects the concerns evident in society at the time. Golden age science fiction was generally optimistic and embraced the combination of space travel, exploration and technology. The golden age of science fiction tapered off into the fifties, as the pervasive feel of the cold war started to bite, both in the United States and in

Europe (Rottensteiner, 1975). In the 1960s a new group of British science fiction authors including Brian Aldiss and J.G. Ballard emerged, calling themselves the 'New Wave', promoting their work through a magazine titled 'New Worlds' (Clute & Nicholls, 1999). The New Wave reflected a high level of dissatisfaction with existing science fiction publishing structures, and the impact of their story lines – often focussed on potential long-term environmental damage – was significant, as was the quality of their writing. These themes obviously reflected contemporary concerns about the impact of humanity on the planet. Industrial design was developing similar preoccupations at the same time.

It has been widely recognised that science fiction cinema is a method of exploring the concerns of the public (Kuhn, 1990). The 1950s saw a flood of science fiction movies from Hollywood: evidencing the American preoccupation with the Cold War, and the use and misuse of technology. Issues ranging from the atomic bomb and the spectres of radiation and fallout, to the role of the military and the Government surfaced in these productions, with radiation in particular being blamed for all manner of ills from giant insects to shrinking men (Baxter, 1970; Brosnan, 1978). The ever-present movies about alien invasions are generally seen in hindsight as being a metaphor for American apprehension about the threat represented by the Iron Curtain (Sobchack, 1987). *The Day the Earth Stood Still* (dir. Wise, 1951) is a high-quality example of these preoccupations with invasion and the role of technology. Cold-war paranoia is explored in *The Invasion of the Body-snatchers* (dir. Siegel, 1956).

The 1980s saw the emergence of the body of science fiction termed 'cyberpunk'. The major theme in cyberpunk was virtual realities – a concept widely known as 'cyberspace', a word coined by science fiction author William Gibson, who was the main proponent of the form (Butler, 2000). Bruce Sterling was the other main exponent of cyberpunk, as author, editor, and critic. A second theme in cyberpunk is urban dystopias – the degrading of the urban environment (in contrast to many of the utopian futures in the science fiction of the 1970s). The people who inhabit cyberpunk are also a contrast to much earlier science fiction: the major characters tend to be the have-nots, as opposed to the blond, square-jawed heroes of many earlier science fiction tales

(Butler, 2000). Ridley Scott's 1982 movie *Blade Runner* is seen as the first hint of cyberpunk at the movies: this dark and gritty vision of the future was, like so much science fiction on the screen, not well received at the time by the critics, but has since become a classic of the genre (Sammon, 1996).

Science fiction in the very early part of the 21st Century is relatively healthy, although there are no contemporary movements visible in the genre. That is not to say that the genre does not face challenges. *Time Magazine* (Krantz, July 8, 1996) notes a change in the composition of the science fiction fan base owing to the variety and number of contemporary media. Traditionally, the core science fiction enthusiast has been a reader of science fiction; with the growth of science fiction in electronic gaming, on television and at the movies, Krantz suggests that the genre will change shape completely as new fans are attracted to a particular medium rather than exploring the body of written science fiction that has been the centre of the genre.

4.6 *Good science fiction*

4.6.1 Balance

Good science fiction is difficult to define. Because science fiction as a genre focuses as much on ideas as on the way the ideas are expressed, science fiction is not only critiqued on the relative quality of its medium (is it a good movie / novel?) but equally, and possibly more importantly, from an overlapping standpoint that focusses on the quality of its ideas. Fantasy author Sylvia Engdahl notes:

To many science fiction specialists, literary quality lies in the use of new and original concepts that haven't been seen before. I was once advised that to write for the SF market I'd need to slant my books towards people who had read at least 500 science fiction novels previously – and that was over 25 years ago. (Engdahl, 1990. www.sylviaengdahl.com/spacemyth.html)

This dual approach to the generation and consumption of science fiction is apparent in many fora where science fiction is discussed: the quality of the media is considered as a side issue to the quality of the ideas. Lecturer in science fiction studies K. Watts (2003) observes that "*SF readers are perhaps more tolerant of bad writing, as long as the ideas at the center of the story add something to the "matrix of meaning that is science fiction."*" (Watts, 2003. <http://faculty.smu.edu/kwatts/notes.html>).

Fortunately, ideas and quality are not mutually exclusive, but this issue – the balance between ideas and literary quality – complicates any assessment of science fiction.

4.6.2 Sense of Wonder

'Sense of Wonder' is a term used widely and broadly as a characteristic of 'good' science fiction. Rottensteiner describes the sense of wonder:

...science fiction derives its psychic motivation from the sources that inspire all tales of the marvellous, all stories that refuse to be limited by what is possible in everyday life. This quality, a deep longing for the different, for otherness, for a departure from the familiar norm, a desire to experience (if only in the mind) something unheard of, is what the initiated readers of science fiction like to call 'the sense of wonder': an ability to accept the radically different with an open mind, or to look at the familiar with a fresh eye, transforming it, as it were, into something strange and wonderful. (Rottensteiner, 1975. p. 9)

Clute and Nicholls' entry under 'Sense of Wonder' in *The Science Fiction Encyclopaedia* covers one and a half pages (a substantial entry), and limits its discussion to a literary context. 'Sense of wonder' is introduced as a cliché of fan criticism, and is defined as "*the sensation which... good sf should inspire in the reader*" (Clute & Nicholls, 1999. p. 1083). In the course of the entry, Clute and Nicholls collate several opinions on the concept, connect the idea with the Sublime, and conclude that the 'Sense of Wonder' is achieved by the forcing of

a conceptual breakthrough, a paradigm shift. This position is supported by Landon who states in his discussion of science fiction cinema "For if we think of what it is that science fiction 'does', surely we must acknowledge that its frequently mentioned "sense of wonder" derives from a "new way of seeing". (Landon, 1992. p. 94)

Clute and Nicholls go further than merely discussing the sense of wonder; they expand on the concept at length under the entry 'conceptual breakthrough', which they propose as a clearer term. There are issues around the 'sense of wonder' that are contradictory and difficult to resolve. One point of contention is that it is not only 'good' science fiction literature that inspires it: Clute and Nicholls cite what they term "*loci classici*" (Clute & Nicholls, 1999. p. 1084) of the sense of wonder in the novels of E.E. 'Doc' Smith (the *Lensmen* series, commencing with *Triplanetary*, 1948) and A.E. van Vogt, who are clearly identified as authors of 'pulp' novels.

The second issue is that the 'sense of wonder' defines science fiction by its effect rather than by its content or presentation. There is no definite conclusion to this debate.



Figure 4.10
Chris Foss: *View from the Stars*. The use of huge objects, vast distances and an alien environment demonstrates science fiction's Sense of Wonder in illustration. *Chris Foss Picture Gallery*.
<http://www.altanen.dk/images/CF21stCentury006.jpg>

In most sources that discuss 'sense of wonder', Clute and Nicholls (1999) Rottensteiner (1975) and Hartwell (1984), for example, the idea is related solely to science fiction literature. This appears to be a shortcoming associated with the literature-specific focus inherent in many science fiction histories. However, there is an historical precedent for the connection of the sense of wonder to other media. In 1757, Edmund Burke's essay *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* identified examples of the Sublime in areas outside literature; notably painting and architecture (Burke, cited in Walker (1997)). Taking this idea further, Scott Bukatman (Kuhn, 1999) among others has connected the Sublime with the Sense of Wonder in science fiction cinema, and that industrial design elements are often associated with the sense of wonder in science fiction movies (Landon, 1992). The sense of wonder is clearly evident in illustration as well as in gaming. While the sense of wonder is not necessarily associated with 'good' science fiction, it is considered that the concept is a characteristic that can be

used to describe the impact of some science fiction ideas and modes of delivery of those ideas (Landon, 1992).

In terms of this study, cyberpunk author Bruce Sterling has short-circuited much of the previous discussion by directly associating the sense of wonder with the design works of Norman Bel Geddes (Sterling, 2005a. http://www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006). It is interesting to note that the term that Clute and Nicholls prefer - 'conceptual breakthrough' - is a phrase that is quite at home in a design studio.

4.7 *Themes and Issues in Science Fiction*

4.7.1 Media

The core of science fiction has traditionally been the significant body of literary work: short stories and novels. However, as a literary genre, science fiction is relatively low-key – for example, in online book retailer www.amazon.com's *100 Best of the Millennium* readers' poll, 86 of the books are fiction, of which 10 can be considered science fiction. This compares to horror (eight) and fantasy (seven, but including three of the top six books) while the remainder include a smaller smattering of thrillers and crime novels. (*100 Best of the Millennium*, 2000. <http://www.amazon.com/exec/obidos/subst/features/c/century/millennium-books-1-25.html/ref%3Dgw%5Fm%5Fce%5Fcol%5Fbo%5F2/104-4302020-6217512>)

By contrast, science fiction is by far the most visible cinematic genre: science fiction movies occupy half of the places on the 20 highest-grossing movie list (which lists movies in terms of the amount of money paid by audiences). Table 3 shows the 'highest grossing' list of international movie releases from April 2006, listed on the *Internet Movie Database* website (All time box office gross, international, 2006, [www:imdb.com](http://www.imdb.com). <http://www.imdb.com/boxoffice/>

alltimegross?region=non-us). Science fiction movies form the biggest single block, and that the second largest block are movies that combine fantasy and monomythic elements.

Position	Title	Director	Themes
1	<i>Titanic</i>	Cameron, J.	Romance
2	<i>The Lord of the Rings: The Return of the King</i>	Jackson, P.	Monomyth
3	<i>Harry Potter and the Sorcerers Stone</i>	Columbus, C.	Monomyth
4	<i>Star Wars: Episode 1: The Phantom Menace</i>	Lucas, G.	Science fiction
5	<i>The Lord of the Rings: The Two Towers</i>	Jackson, P.	Monomyth
6	<i>Jurassic Park</i>	Spielberg, S.	Science fiction
7	<i>Harry Potter and the Goblet of Fire</i>	Newell, M.	Monomyth
8	<i>Shrek 2</i>	Adamson, A.	Fantasy
9	<i>Harry Potter and the Chamber of Secrets</i>	Columbus, C.	Monomyth
10	<i>Finding Nemo</i>	Stanton, A.	Monomyth
11	<i>The Lord of the Rings: The Fellowship of the Ring</i>	Jackson, P.	Monomyth
12	<i>Star Wars: Episode III: Revenge of the Sith</i>	Lucas, G.	Science fiction
13	<i>Independence Day</i>	Emmerich, R.	Science fiction
14	<i>Spider-Man</i>	Raimi, S.	Science fiction
15	<i>Star Wars</i>	Lucas, G.	Science fiction
16	<i>Harry Potter and the Prisoner of Azkaban</i>	Cuaron, A.	Monomyth
17	<i>Spider-Man 2</i>	Raimi, S.	Science fiction
18	<i>The Lion King</i>	Allers, R. & Minkoff, R.	Monomyth
19	<i>E.T. The Extra Terrestrial</i>	Spielberg, S.	Science fiction
20	<i>The Matrix Reloaded</i>	Wachowski, A & Wachowski, L.	Science fiction

Table 3
Highest grossing movies,
April 2006, *Internet Movie
Database website*
<http://www.imdb.com/boxoffice/alltimegross?region=non-us>

This means that science fiction cinema is both an important cinematic genre and a major element of science fiction – far more visible than the body of written work. However, Landon (1992) describes a certain antipathy towards science fiction movies from people with a background in science fiction literature, evident in publications such as Peary (1984) and Haber (2003). Critics often point to poor science and flaws in the internal logic of the movie's world, with the need to remain consistent being sacrificed to the need to

entertain (for example Silverberg, in Peary (1984)). Science fiction movies are also (stereo)typically based on concepts that have been previously explored in science fiction literature, but do not take the time to investigate them properly (Disch, 2000).

Star Wars in particular has transcended its genre origins and created its own culture and myths, and a generation has grown up with the fabric of George Lucas's world as part of their wallpaper. In the context of reviewing an exhibition of science fiction memorabilia for the New York Times in 2005, Edward Rothstein notes "...that a genre that 80 years ago was on the margins is now, at least in its cinematic incarnations, at the very centre of culture." (<http://www.nytimes.com/2005/05/24/arts/design/24scif.html>). Critically, as a scholar who is interested in science fiction cinema, Landon notes that:

I belong to a generation who came to SF largely through these films, just as my children's generation understands SF primarily through TV, video, video games, and increasingly, through computers. (Landon, 1992. p. xvii)

This introduces the other aspect that is changing science fiction: electronic gaming. Gaming in all its forms ranks as an activity that is part culture and part media. The recent development of electronic games on both computers and game consoles such as *Sony's* Playstation and *Microsoft's* X-Box have created a new area that overlaps with the core of science fiction.

Many computer games are based on science fiction ideas. Some games have originated from tie-ins with movies, while others use science fiction imagery within an otherwise familiar construct (*Halo*, Bungie (2003); *Doom*, Carmack (1992)), while others are genuine attempts to create a science fiction experience using science fiction ideas and modes of operation (*Homeworld*, Relic Entertainment (1999)). In the same way that science fiction cinema has developed its own way of operating, science fiction electronic games are developing their own way of generating a science fiction experience. The narrative content can be high, and the world of the computer game may need to be as well understood by the game developers as a literary science fiction

world has to be by its author, or a cinematic world understood by the movies' design team.

4.7.2 Designing science fiction worlds

Like industrial design, science fiction is critically interested in contexts. However, while industrial design needs to understand how people behave in specific contexts, science fiction is primarily interested in creating new contexts within which narratives can be constructed. Despite these differences, this is one aspect of both areas where they do many of the same things for the same reasons.

The difficulty of constructing a whole world literally from the ground up, and sometimes including the ground, cannot be underestimated. Building new worlds is the art of inventing a novum – or many nova – and assembling them into a coherent framework that can be interpreted through the narrative.

One of the minor themes in science fiction literature is advice on 'how to do it' – much of which focuses on creating believable fictional worlds. Science fiction author Bob Shaw's contribution to this do-it-yourself advice is an article in *Interzone* (a science fiction genre magazine that publishes a mixture of fiction and non-fiction) titled "*How to write science fiction*". The article opens with a brief discussion of the importance of science fiction ideas in genre literature, but the bulk of the 9-page article discusses 'world-building'. This includes developing technologies and artefacts such as robots, spaceships and rayguns, as well as the challenges in inventing aliens (Shaw, in *Interzone* 67, (Jan 1993)).

David Eddings – author of the fantasy series *The Belgariad* (five books, starting with *Pawn of Prophecy* (1983), *The Mallorean* (five books, starting with *Guardians of the West* (1987)), spent several years creating the world within which the novels would be set. The level of detail required included thousands of nova: mythology, identities and histories for all the cultures involved in the story, fashion, artefacts, art and architecture. Clearly this is a major undertaking; the work required to build the Eddings' world was substantial

enough that the author assembled this research and published it as a standalone book, *The Rivan Codex*. (Eddings & Eddings, 1998). This suggests that establishing the 'mythology' of new worlds is an important element in creating a cohesive narrative.

Even toys can benefit from having a world built around them. In a review of the *Bionicle* range of toys by the well-known toy manufacturer *Lego*, the Sci-fi Weekly columnist Sean Huxter concludes by saying:

It is clear that the rich backstory Lego has constructed around the heroic Bionicles can increase a child's imaginative link with these toys, setting up scenarios that make children's mind soar and to give them some sense of character and place, ensuring a lasting appeal for young and old alike. (Huxter, n.d. <http://www.scifi/sfw/issue228/cool.html>)

'Backstory' is another term for 'world building'. The terms 'internal universe' and 'mythology' are also used to describe the concept.

Science fiction cinema also needs to invent new worlds, and must engage with a wider range of ideas in order to achieve a fictional world within which both the narrative and the images of the movie can exist. Cinema (as a visual medium) must reach far higher levels of definition of its visual elements than is required or possible in science fiction literature. This level of definition and breadth of context is a distinctive aspect of science fiction cinema.

The directors of the movies *Minority Report* and *The Fifth Element* (dir. Besson, 1995) both used forecasting processes to establish what the worlds depicted in the movies might look like. The development of *Minority Report* was directed by the use of a group of experts, who were gathered together over a weekend and tasked with creating an appropriate future. The experts included anthropologists, designers, town planners, sociologists, electronic engineers, and so on. (*Minority Report* [DVD], Fox Movies, 2002). The impact of this work is clearly evident in the movie, with the production design showing both depth

and breadth of design understanding. This is similar to the expert panel forecasting process sometimes used in industrial design practice.

The development of *The Fifth Element* was less concentrated, but involved the production team methodically working through potential production design content based on the themes of transport, communications, weapons and so on. Dan Weill, who was the production designer for *The Fifth Element*, describes the process:

For The Fifth Element, we set up a research studio for a year to develop a vision of New York in the future and its iconography. We employed 12 artists and illustrators, including Moebius and Jean-Claude Mezieres, authors of the science fiction comics to which Luc Besson was addicted in his youth. Each week, we'd focus on a different theme: cars, apartments, money, food, domestic accessories, space travel. As the production designer, my role in the process was as much editorial as creative. ...Contemporary design is about simplifying the lines and the operational features of the technology that we live with; and yet most futuristic design one sees in the cinema complicates everything – there are flashing lights, dozens of buttons and switches, smoke. Getting the level of technology right was essential to me. We had a big discussion about telephones; can mobile telephones get any smaller than they are now? No, because the distance between the mouthpiece and the receiver cannot be diminished any further... Will everyone have videophones? No, because you might not necessarily want to be seen by the person you are talking to... (Weill, in Ettedgui, 1999. p. 186)

Like *Minority Report*, the production design of *The Fifth Element* is a key characteristic of the movie, although there are obvious differences between the two productions in the way that these design elements connect with the narrative.

It can be concluded that the concept of world-building plays a significant role in the development and communication of science fiction narratives, both on the page and on screen.

4.8 *Science Fiction and the Present*

It would be simple to dismiss science fiction as speculation about the future - sometimes idle, sometimes serious. However, as this study has demonstrated, science fiction is anything but simple, and these speculations exist for a reason. This is why science fiction exists, and this reason defines the role of the genre.

Isaac Asimov described the role of science fiction as:

Modern science fiction is the only form of literature that consistently considers the nature of the changes that face us, the possible consequences, and the possible solutions. (Asimov, cited in Gökce, 1996. www.panix.com/~gokce/sf_defn.html)

This description identifies what science fiction *does* rather than trying to define *what it is*, an approach that sidesteps any discussion of definitions and cuts to the heart of the genre. An even clearer description comes from *Sci-fi Weekly* columnist Will McCarthy:

...the job of science fiction is not to predict "the future", but to sift through the infinity of possible futures and to bring back lessons which can help us here in the present day.
(McCarthy, 2002. www.scifi.com/sfw/current/labnotes.html)

Explicit in McCarthy's description of what he terms 'the job' of science fiction is what can be learned from explorations of the future. Concern with the future is implicit in Asimov's use of the term 'change'. McCarthy and Asimov both see science fiction providing direction for decisions that we make today. The role of science fiction, therefore, is to mediate between the future and the present.

The two overlapping aspects of science fiction that contribute to its ability to perform this role were identified in Section 4.3.1: anticipation and interrogation. Science fiction is not trying to affect the future (as might be supposed) but is trying to influence the present.

Bruce Sterling reinforces this view of science fiction:

The job of SF is not to reveal your destiny. It's to expand the spectrum of possibility and refresh your thinking. (Sterling, 1999. <http://slashdot.org/interviews/99/10/08/1147217.shtml>)

This study proposes that within this context (the relationship between science fiction and the present) it can be seen that the relevance of the genre increases in proportion to the rate of change in technology and society. The concerns raised by futurologist Alvin Toffler in his book *Future Shock* (Toffler, 1970) could be addressed through the use of science fiction to mediate and moderate the impact of change.

This study further suggests that science fiction could play a similar role to that of industrial design – mediating the relationship between the present and the future. However, mediation between the present and the future is dependent on any message being read by those who can direct contemporary decisions. In this respect, science fiction falls short as the ideal vehicle for directing the future, as any genre will only be experienced by those who are interested in its ideas in the first instance. This study argues that that cinema is therefore an important tool for science fiction to fulfil its role, as science fiction ideas that are expressed through films reach a higher number of people than through any other medium.

4.9 Summary

Science fiction is a genre of ideas that are expressed through a wide variety of narrative themes. The key aims of science fiction are the overlapping ideas of *anticipation* and *interrogation*, and the role of science fiction is to explore

possible futures and bring back lessons that can guide decisions being made today.

There is a wide variety of intents, or ways that science fiction can be used as a tool. Science fiction has four levels: ideas, processes, products and culture, and contemporary science fiction ideas are expressed through a wide variety of media, including literature, radio, cinema, and television.

The stereotype of science fiction is of a genre where idea is more important than character, although the genre has developed far past this stereotype. The building blocks of science fiction are the overlapping, related terms *novum* and *subjunctivity*, which can be used to describe the way that science fiction works with new ideas. World-building describes the way that contexts are created from these new ideas.

There are many definitions of science fiction, partly owing to the way that science fiction overlaps with the genres of horror and fantasy. Science fiction can be defined in terms of the ideas expressed in the body of work, and by how that work is perceived by those experiencing it. This is related to the two 'models' of the development of science fiction: one is based on the *perception* of science fiction ideas and ways of expressing ideas, while the other is based on the *intention* to include science fiction ideas. Science fiction reflects many concurrent cultural concerns.

The concept of the 'sense of wonder' describes the effect that good science fiction should inspire, no matter what media the ideas are expressed through. Science fiction cinema is the most visible of the contemporary science fiction media, and is also the most visible cinematic genre. Cinema is therefore an important medium in the communication of science fiction ideas to the highest number of people.

The role of science fiction is to mediate between the present and the future. The genre employs the tools of *anticipation* and *interrogation* to perform this function.



Chapter 5: Industrial Design and Science Fiction

5.1 Introduction to the chapter

This chapter draws together the themes woven through Chapter 3: Industrial Design and Chapter 4: Science Fiction. The aim is to analyse the relationship between industrial design and science fiction using the issues and examples introduced in the previous two chapters, and to establish the relevance of the relationship to industrial design. The parallels – aspects where the same things are happening or have happened for the same reasons - are discussed, and the key parallel (the overlapping ideas of *innovation* and *novum*) is examined. The roles of each area are compared, and the differences between the two areas are discussed.

Two further aspects of the relationship are defined:

1. The industrial design in science fiction.
2. The science fiction in industrial design.

Similar issues appear in both industrial design and science fiction and the relationship can be modelled graphically. Through the chapter, a model is introduced and developed in five phases into a coherent diagram that connects with the hypothesis, and is unique to this study. The chapter concludes with a comparison of the roles of each area, and proposes cause-and-effect elements of this relationship.

This chapter draws almost entirely on the themes introduced in the previous two chapters. Some new material from the literature review is introduced to expand on ideas that have already been discussed.

Four of the supplementary study questions are addressed through this chapter.

- a. What is the nature of the connection between industrial design and science fiction?
- d. What impact does industrial design have on science fiction?
- e. What can industrial design learn from science fiction?
- f. Are science fiction processes and ideas of relevance to industrial design projects?

5.2 Literature Review

5.2.1 Introduction to the literature review

As mentioned earlier, there is little literary material that connects industrial design and science fiction. The literature review, therefore, looked for:

- Examples that *discuss* industrial design and science fiction;
- Examples that *demonstrate* the ideas in this study;
- Material that would support the discussion of case studies.

The four publications and one website that appear in this section constitute a significant proportion of the work that discusses or demonstrates any commonality between industrial design and science fiction.

The three books *Yesterday's Tomorrows: Past Visions of the American Future* (Corn & Horrigan, 1984), *Where's My Space Age: The Rise and Fall of Futuristic Design* (Topham, 2003), and *Out of Time* (Brosterman, 2000) discuss specific aspects of the industrial design / science fiction relationship, particularly the benefit of hindsight when reviewing the history of the future and its impact on culture. Eugene Thacker, lecturer in Media Studies at Rutgers University, underlines the relevance of using the past to explore the future:

Put simply, every imagined future has its past, just as every historical moment has its own vision of the future. We need only to recall the changes in architecture, science fiction film, illustration & design, consumerism, and most of all technology, to grasp this point. Science fiction can not only reveal the baroque industrial clutter of the early twentieth century, the streamlined futures of the 1930s, the post-war outer space habitats of the 1950s, or the virtual futures of the 1990s, but that it also provides a critique of the very ideological underpinnings of the task of imagining the future.
(Thacker, 2000. www.ctheory.net/text_file.asp?pick+220)

Thacker neatly ties together many of the themes evident in this literature review and in the study as a whole.

The other two examples, *Sentinel* (Mead, 1979), and the website www.retrofuture.com, do not discuss the ideas directly but exemplify the issues in this study by demonstrating an almost seamless integration between industrial design and science fiction.

5.2.2 Key texts

- *Yesterday's Tomorrows: Past Visions of the American Future* (Corn & Horrigan, 1984)

Yesterday's Tomorrows explores the relationship between American culture and the future - a theme that inevitably connects industrial design and science fiction because of the role that design has in the creation of that culture. The picture that Corn and Horrigan assemble shows strong parallels between industrial design and science fiction, albeit focussed on a relatively narrow aspect of the relationship.

Yesterday's Tomorrows draws from a variety of sources, and ranges across several aspects of popular culture, including consumerism, architecture, entertainment, toys, and design. It is obviously the latter that makes the book of interest to this study. Many of the names and ideas discussed in the previous two chapters of this study appear in this book, including Norman Bel Geddes, Arthur C. Clarke, Henry Dreyfuss, H.G. Wells, the 1939 New York World Trade Fair, Syd Mead, and Streamlining. The book includes many science fiction illustrations and references to movies. Corn and Horrigan note that the influence of science fiction ideas in periodicals, hobby magazines, pulp magazines, advertising, movies, radio and television was a key aspect in how Americans came to be enthusiastic about technology and the future.

The sheer breadth of explorations of the future appears almost inextricably tied into American culture. The book is littered with iconic American identities such as the *Ford Motor Company*, *General Motors*, *RCA/Whirlpool*, Frank

Lloyd Wright and Walt Disney, who linked themselves with the idea of progress through the use of forecasting and the dissemination of provocative design ideas.

While many of the images and ideas highlighted in *Yesterday's Tomorrows* are trying to predict the future, clearly some are not and are striving for something else entirely. Where predictions are being attempted, with the benefit of hindsight, it is evident that many of the ideas are wildly awry. This is an interesting aspect of the publication, and appears in the work of both designers and non-designers.

- *Out of Time: Designs for the Twentieth Century Future* (Brosterman, 2000)

Out of Time supplements the themes in *Yesterday's Tomorrows*, and while Brosterman is focussed solely on the futuristic ideas represented in illustration, the parallels between industrial design and science fiction are clearly evident.

Like *Yesterday's Tomorrows*, *Out of Time* identifies the influence of the American industrial designers Bel Geddes, Dreyfuss and Loewy in the design of vehicles, house and locomotives. *Out of Time* also briefly discusses how Harley Earl's designers at General Motors applied aeronautical and astronautical imagery to car design. The science fictional, provocative nature of the imagery and design ideas is clear, and Brosterman employs the design and science fiction ideas in illustrative works to demonstrate how these two areas have contributed to American culture.

Both *Yesterday's Tomorrows* and *Out of Time* consider investigations of the future to be almost solely an America province. While Corn and Horrigan state this as an aim in their book, Brosterman's history of the future starts with Wells (English) and Verne (French) and moves the focus instantly and exclusively to America for the remainder of the book. Whether this reflects a conscious choice or unconscious bias is not clear.

- www.retrofuture.com

www.retrofuture.com is a website that works with much the same themes as Bosterman (2000), and Corn and Horrigan (1984). The difference between the two 'past futures' books and *retrofuture.com* is that the website is more focussed on products and concepts than culture; how the products or concepts worked, and their ultimate fate.

The discussion of the products describes the origins of the idea in some depth, and with the benefit of hindsight suggests why the ideas succeeded or not. Norman Bel Geddes' Futurama showpiece for the 1939 World Trade Fair is mentioned, as is Buckminster Fuller's Dymaxion design concept. The website says of Fuller "*Bucky's been gone almost twenty years, but he's still ahead of his time.*"

Much like the two 'past futures' books, www.retrofutures.com is of interest to this study as it demonstrates the parallel issues in industrial design and science fiction through the exploration of futures, but – despite being so product focussed – it seems to be beyond the intent of the website to make anything more of the issues raised.

- *Where's My Space Age? The Rise and Fall of Futuristic Design* (Topham 2003)

The book complements the ideas evident in *Yesterday's Tomorrows*, *Out of Time*, and *retrofutures.com*, but encompasses a slightly different set of ideas. Where the previous books use science fiction as a launching pad for their explorations of past futures, *Where's My Space Age?* is focussed on the connection between space flight and avant-garde futuristic design. Science fiction as a genre appears regularly in the text and illustrations, but it is only a sidebar to the description of the development of space flight on both sides of the Iron Curtain.

While the avant-garde is not the same as industrial design, *Where's My Space Age?* is of interest as it discusses the relationship between design,

culture and science, with a smattering of science fiction thrown into the mix. The discussion of avant-garde design is very broad, and is focussed more on fashion, furniture and one-off works of art than on mass-produced products. There is mention of cars but little of product design. The American designers Joe Colombo and Verner Panton receive some attention for their exploratory design work, but otherwise the book veers towards one-off installations with futuristic themes. However, some of these examples date from the late 1990s and the materials and technologies evident show that interest in the future is still very much alive.

This book updates ideas about what is regarded as futuristic, connects design and culture within the context of futurism, and is a valuable resource for this reason.

- *Sentinel* (Mead, 1979)

Syd Mead is a name that appears in four chapters of this thesis. He is an industrial designer, a designer for science fiction cinema, and a highly accomplished renderer: *Sentinel* is a collection of Mead's illustrative work for a variety of clients. Most of the illustrations are centred on vehicles, and there is a smattering of product design as well.

However, it is often the relationship between his backgrounds and the focal point of the drawings that are of real interest. Mead has a distinctive ability to create scenarios around his designs (a technique discussed in 3.7.2 Process), and the backgrounds fill in details about the world the object exists in. Most of the backgrounds that Mead uses place his vehicle designs in futuristic, science fiction contexts, and it is clear that Mead is familiar with science fiction ideas.

Sentinel is an important source for this study for two reasons:

1. The body of work, which in topic and presentation demonstrate the ideas that are central to this study;
2. Mead himself has a high profile with both industrial design and science fiction owing to his design contributions to a number of what Mead terms

"signature" science fiction films (Mead S., personal communication, 2005).

Syd Mead is discussed in more detail later in this chapter and in Chapter 6: Case Studies.

5.3 *The Model (Phase 1)*

5.3.1 Introduction to the model

The development of a structure or model within which the relationship between industrial design and science fiction could be demonstrated and examined was the main aim of this study.

The industrial design / science fiction relationship lends itself to expression through a graphic model because of the clarity of the connection between the two areas. How this is expressed becomes clear as the model is developed through this chapter. The order that the ideas are introduced in through this chapter approximates the way that the understanding of the topic area developed over the course of the study.

5.3.2 The Model

At the core of this model are the two areas in this study: industrial design and science fiction. At this stage there is no connection between these two areas, although there is some sense that something is happening in the background.

Phase 1 of the model is on page 124.

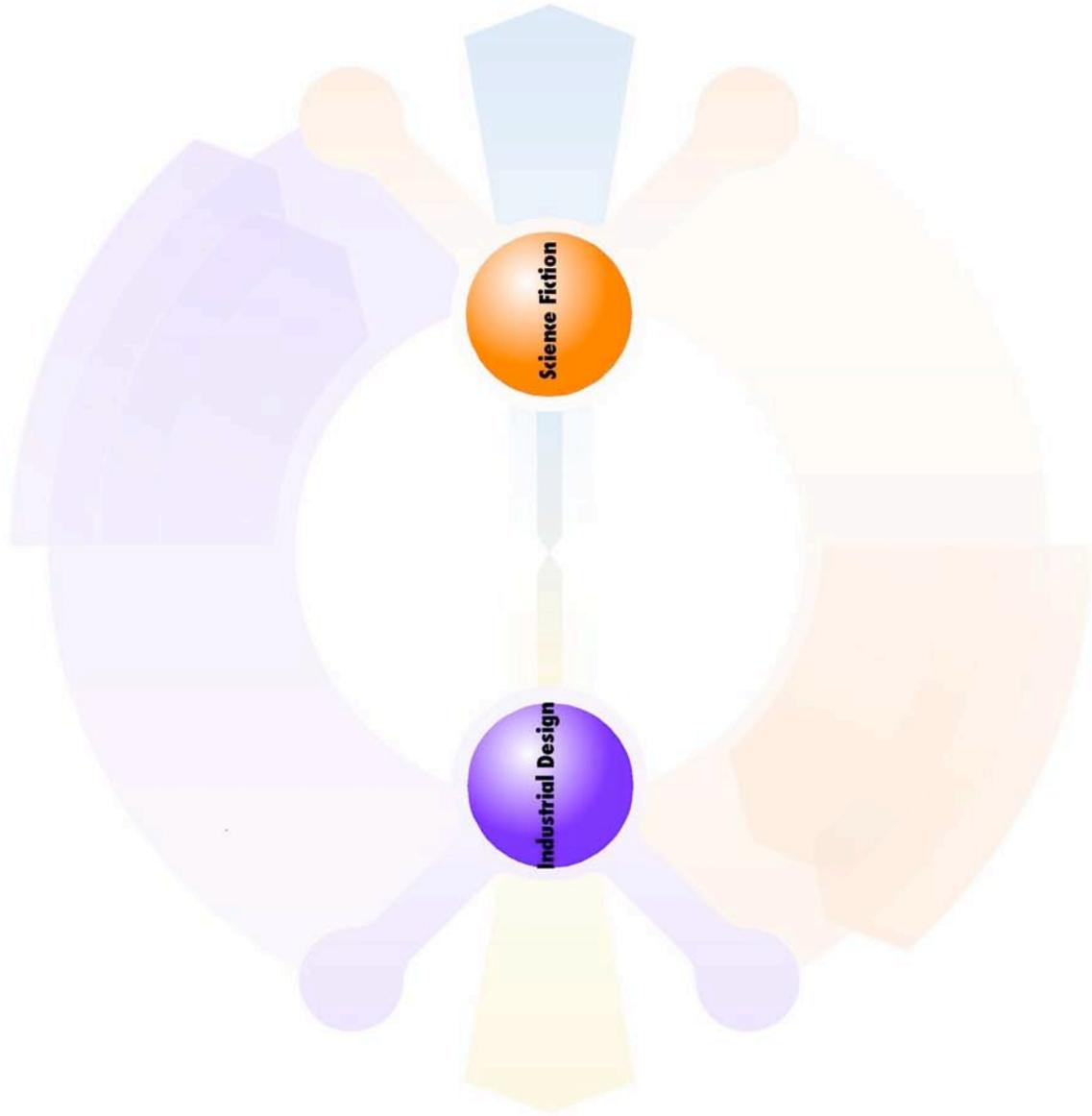


Figure 5.1: The Model (Phase 1)

5.4 Overview

5.4.1 Precedents



Figure 5.2
Martin Conquest motorbike for wheelchair users (2005): gives the impression of being a science fiction object by using imagery that matches expectations of what science fiction looks like.

Jacaremoto,
http://www.jacaremoto.com.br/motos/fotos/martinconquest_01.jpg

Much of today's industrial design looks like yesterday's science fiction. This trend is not only apparent in contemporary industrial design, it is also evident in the way that even a cursory glance at popular writings on design and technology identifies articles on upcoming developments that describes them as previously being in the realm of science fiction. A short review in *The Independent Online Edition* demonstrates this implicit connection between design, technology and science fiction. A review of the Martin Conquest 850 – a motorcycle-based vehicle specifically designed to carry people in wheelchairs – twice refers to the science fictional appearance of the vehicle (Jeffrey, 2005. <http://motoring.independent.co.uk/features/article307580.ece>).

These statements hide a wealth of connections between science fiction and industrial design. Science fiction and industrial design parallel each other at several points and overlap at others. These parallels include the developments of both areas, some processes, and two related and critical links – that both industrial design and science fiction explore the future to direct the present, and that these explorations are typically focussed on the impact of technology. An understanding of these parallels in turn highlights areas where industrial design is represented in and contributes to science fiction.

At some points, science fiction and industrial design do many of the same things for many of the same reasons: some of this activity relates to their mutual interest in the future, and some to the processes that are used to explore the future. While it might seem as though science fiction is interested in the future and industrial design is interested in the present, in the previous chapters it was proposed that the converse is also true.

These overlaps demonstrate the roles of both areas.

5.4.2 Previous Discussion

Specific mentions of the influence of these two areas on each other are very limited. There is some acknowledgement of the most obvious overlaps between design and science fiction: Streamlining seems to be one aspect of design that attracts attention, also the design elements of particular movies, or less often the contribution of particular designers to the cinema. For example, Woodham notes a similarity of themes in design and science fiction during the 1920s and 30s:

Several writers have suggested strong parallels between the futurist Utopias of popularising industrial designers such as Norman Bel Geddes and the visions described in contemporary science fiction, a genre which flourished in the late 1920s and early 1930s.... Concepts such as speed and change, and the exploration of the possibilities of new materials, together with the development of modes of transport and appliances were also common to the extravagant futures portrayed by Bel Geddes and many science fiction writers, illustrators and filmmakers. There was, in addition, a mutual faith in the power of technology as a means of transforming society for the better. (Woodham, 1997. p. 71)

Woodham does not carry this further into his analysis of design and design culture through the twentieth century, and there is little analysis or understanding of what these overlaps mean. The reality of this connection is that while, at first glance, the products of industrial design are apparent in science fiction and worthy of some attention owing to the sheer visibility of the products (particularly science fiction cinema), the science fiction in industrial design is less obvious and requires some analysis to understand its significance.

As discussed in the literature review for this chapter, Corn and Horrigan (1984) examine *Yesterday's Tomorrows* in some depth, and describe the role of industrial designers in the creation of the American future. However, they go no further than linking industrial design with America's consumer driven

culture (of which futurism is a part): a link that has been clearly identified by Woodham (1997) and Meikle (2001). However, the publications by both Brosterman (2000) and Corn & Horrigan (1984) exhibit many parallels between industrial design and science fiction, and it is around these ideas that an understanding of the relationship can be described.

5.5 *The model (Phase 2)*

If industrial design and science fiction are seen initially as disconnected activities, this study identifies several common themes. This phase of the model identifies the common ground between industrial design and science fiction: an area where they are doing the same or very similar things, but are doing them independently. This area of convergence – the parallels – forms the core of the model.

Also added into this phase of the model are the roles of industrial design and science fiction. These act as a filter through which the next sweep of the model occurs.

Phase 2 of the model is on page 128.

5.6 *Parallels*

5.6.1 Development

The previous two chapters show that both industrial design and science fiction coalesced from a miasma of influences at about the same period in the late 18th / early 19th centuries. Early, significant, advances occurred in England, while the focus of development shifted to the United States in the early 20th century. The 'golden age' of design in America, the establishment of the industrial design profession through the work of Loewy and Dreyfuss,

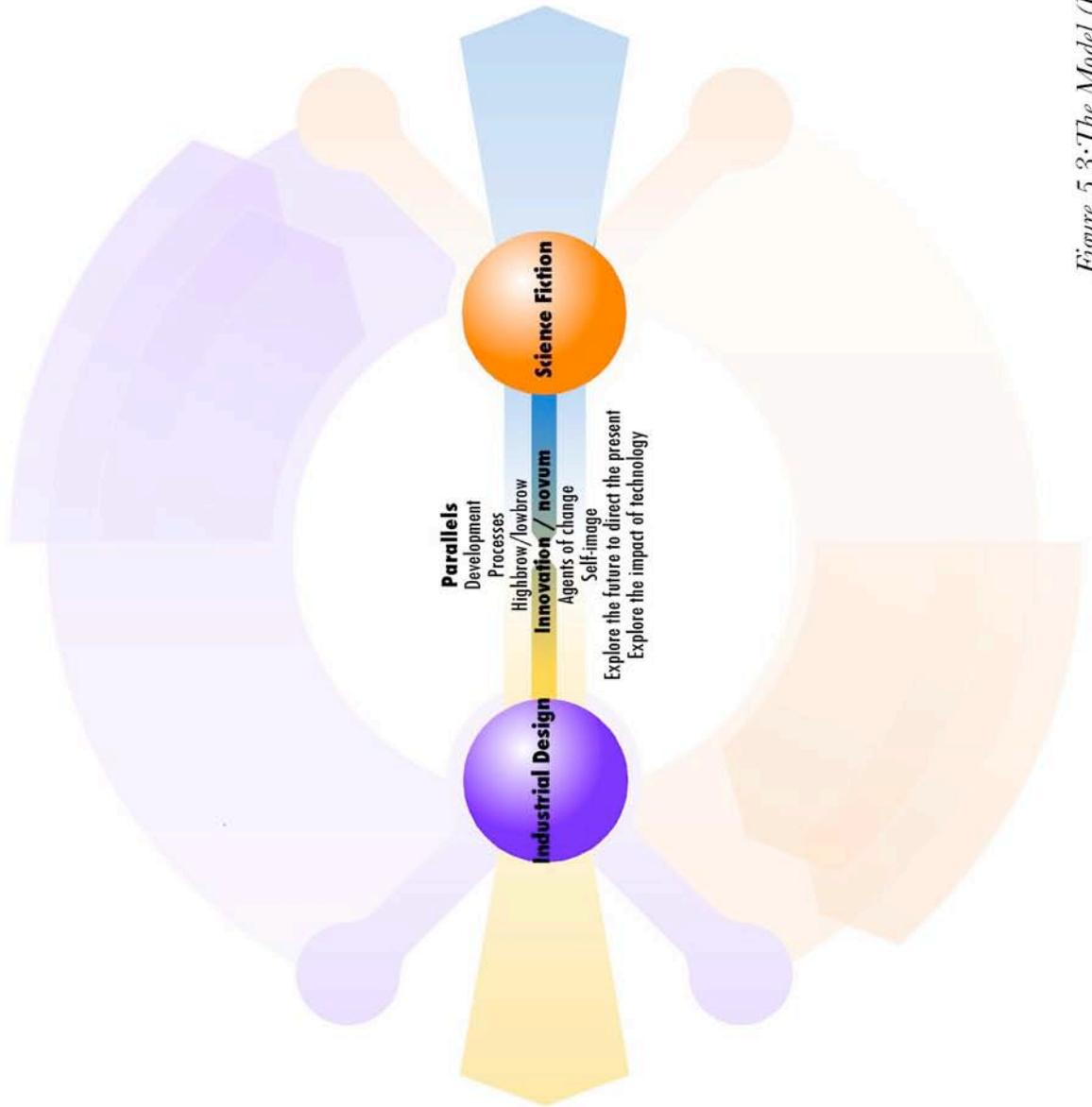


Figure 5.3: The Model (Phase 2)

closely coincides with the 'golden age' of science fiction in the same country (1920s / 30s). These periods in both areas are recognised as being seminal in the development of their self-identity and the prevailing stereotypes (Woodham, 1997, Rottensteiner, 1975).

The development of both areas can also be described by the *perception* and *intention* models.

The strong parallel Woodham is referring to in the quote in Section 5.4.2 is the science fiction and industrial design of the 1920s and 30s (most notably Streamlining), but the link between industrial design and science fiction is also obvious in other eras and areas. These include 1950s American car design, 1980s cyberpunk and postmodernism, the consumerism of the early 2000s, and the celebration of technology in science fiction movies such as *Minority Report*, *Star Wars: The Revenge of the Sith* (dir. Lucas, G., 2005), and *I, Robot* (dir. Proyas, A., 2004.)

Both areas have responded to local cultures by developing distinct regional flavours: design from Italy is as distinctive as science fiction from Hollywood. Japan, for example, has developed its own reputation for both industrial design and science fiction (Burdek, 2005; *Sci-Fi Weekly*).

5.6.2 Processes

In order to map future events, fictional or non-fictional, science fiction and industrial design use similar processes, and sometimes the same processes with different names.

- Science fiction invents contexts as the backgrounds for science fiction narratives. The depth of understanding required to 'design' a world parallels the depth of understanding required to understand the latent needs of users prior to the design of a product. Science fiction calls this world-building, backstory, or the internal universe of the narrative.
- Industrial design is also vitally interested in contexts, sometime those that exist, and sometimes those that only exist as possibilities. Industrial design calls this forecasting, and use scenarios as a key forecasting

tool. Industrial design attempts to understand how people behave in order to shape new products to their needs, and employs a variety of methods to forecast these needs (Laurel, 2003).

Both areas use scenarios as a tool – although for science fiction, the scenario is the end as well as the means.

Science fiction cinema applies many industrial design processes as part of the production design for specific movies. These processes are discussed further in this chapter and in Section 6.5.

It is interesting to note that the future of industrial design processes is almost certainly in the connection between virtual and physical (Burdek, 2005) and that science fiction has already been there, most visibly through cyberpunk (Butler, 2000).

5.6.3 Agents of change

Both industrial design and science fiction have at times become agents of change, protagonists rather than mere commentators or spectators. In the industrial design area, the Bauhaus, Streamlining, and Memphis are examples of the impact that industrial design can have as a profession. The most obvious contemporary product that exemplifies the impact of industrial design is *Apple's* iPod – a product that (together with *Apple's* software iTunes) has created a new way of purchasing music.

Science fiction has become an agent of change in different ways. An example of the way that science fiction ideas can permeate everyday life is George Orwell's novel *1984* (Orwell, 1949), the title of which became a symbol for the uncertainty of the future in the 1960s and 70s. Orwell's constructed character 'Big Brother' became a synonym for the spectre of totalitarianism. The online encyclopaedia *Wikipedia* lists six uses of the term Big Brother, all of which relate to the ideas in *1984*: *authoritarianism*, *surveillance*, *video surveillance*, *Big Brother Award* (an award for acts against personal privacy), and *Big Brother* (a web-based monitoring tool for

computer-systems and computer-networks) (*Big brother*, 2006. http://en.wikipedia.org/wiki/Big_brother).

A less dramatic example, but possibly one of the most important, is the prediction and concept development of the communications satellite by science fiction author Arthur C. Clarke (Malik, 1980).

5.6.4 Self image

Industrial design and science fiction can both be considered as being marginalised. Industrial design struggles with its stereotype and its contributions to the product development process, while science fiction's position as a genre defines it as apart from the mainstream. This study proposes that one reason for this marginalisation is the self-image of challenging boundaries and conventions: 'innovation', or 'creativity' in industrial design terms, 'novum' and 'subjunctivity' in science fiction. These ideas connect directly to the role of both areas, and the ideas described by these terms are at the core of industrial design and science fiction.

5.6.5 Explore the impact of technology

This study has demonstrated the proposition that both science fiction and industrial design play a role in mediating between technology and people. Industrial design deals with new technologies by exploring their use through integration into products, and uses forecasting and scenarios as tools to explore the implications of design decisions. Science fiction explores the wider ramifications of new technologies through what is effectively forecasting through the use of scenarios, suggesting possible impacts on society through narratives woven around individuals.

5.6.6 Explore the future to direct the present

This study contends that both science fiction and industrial design range through potential futures to inform decisions that we make now. This aspect is expressed through the role of both areas, and is also apparent in the

processes that science fiction and industrial design use. Both industrial design and science fiction acknowledge that change is inevitable and also desire to be involved in that change, to direct it for better not worse.

In terms of this study, this is a critical connection between industrial design and science fiction: the desire to change the world on the part of industrial design, while science fiction desires to explore the impacts of such changes. This aspect of the industrial design / science fiction relationship is covered further in Section 5.7.

5.6.7 Innovation / novum

This study proposes that the key parallel and connection between industrial design and science fiction is centred on the concepts of *innovation* and *novum*. This is a theme that runs through all of the parallels described previously. The need to look for the new thing is evident in the development of both areas, and in processes, self-image, and in the focus on technology and the impact of the future on today. Science fiction narratives are full of 'the new thing', and industrial design searches for the 'new thing' to design products around. Without these new things, both areas are starved of meaning and direction.

5.7 Role

In Chapter 3 and Chapter 4 the roles of industrial design and science fiction were proposed.

- The role of industrial design is to mediate between technology and people, employing the tools of forecasting and responsibility;
- The role of science fiction is to mediate between the present and the future, employing the tools of anticipation and interrogation.

The key parallels of innovation and novum were discussed in the previous section. The roles of industrial design and science fiction demonstrate how these key ideas are employed, and what they achieve.

The common theme in the role of both areas is creating futures, and the new ideas encapsulated in innovation and nova are key aspects of these futures. In a broad sense, it can be argued that both science fiction and industrial design use what is learnt from explorations of the future to direct decisions that are made today.

The motivation for creating futures is slightly different for each area. These differences are centred on the word 'fiction': industrial design places itself aggressively in the real world, while science fiction is clearly just that - fiction. The profession of industrial design would strongly resist being described as working in a way even approaching fictive, but it appears from the literature that elements of industrial design practice involve operating in the same way as science fiction does: "*sifting through the infinity of possible futures and bringing back lessons which can help us in the present day*" (McCarthy, 2002. www.scifi.com/sfw/current/labnotes.html) (see Section 4.8). Peter Schwartz notes that a good scenario investigates a variety of possible futures (Section 3.7.3.1). This is not prediction in the sense that scenarios are attempting to define exactly what will happen: the use of scenarios as described by Schwartz closely matches McCarthy's description of the role of science fiction.

While the nature of production technologies and product life cycles inherently require the exploration of futures, this study argues that some explorations and processes encompass research methodologies and timespans that place such design work firmly in the realm of science fiction. In a simplistic sense, a typical commercial design project tries to predict the impact of advances in technology and understand the implications for the user. Much of the work undertaken in design projects has no fictional content (technical resolutions for example) but predictive / exploratory / conceptual work demonstrates industrial design working in a science fiction way.

This study shows that this is the key connection between industrial design and science fiction. This is not just a parallel: the roles of both areas show industrial design and science fiction doing the same things for much the same reasons.

5.8 *The Model (Phase 3)*

While there are a number of strong resonances between industrial design and science fiction, the model shows points of disconnection between the two areas. These distinctions live in the area outside industrial design and science fiction as they are divergent ideas rather than convergent.

Phase 3 of the model is on page 135.

5.9 *Distinctions*

While there are clear parallels between industrial design and science fiction, there are also clear distinctions between the two areas.

Ultimately, whatever its motivation, science fiction explores and articulates its ideas as fiction, while industrial design strives for reality. This study argues that this is the critical distinction between the two areas.

The discussion through the previous two chapters suggests that industrial design can be described as an optimistic activity: even when highlighting problems, there is a clear intent to solve them. The literature shows that the motivation of science fiction appears somewhat different. Some science fiction is wildly optimistic, and ignores any sense of probing or interrogation of technologies or developments. Science fiction may also be deeply pessimistic, and some narratives identify problems without any attempt at

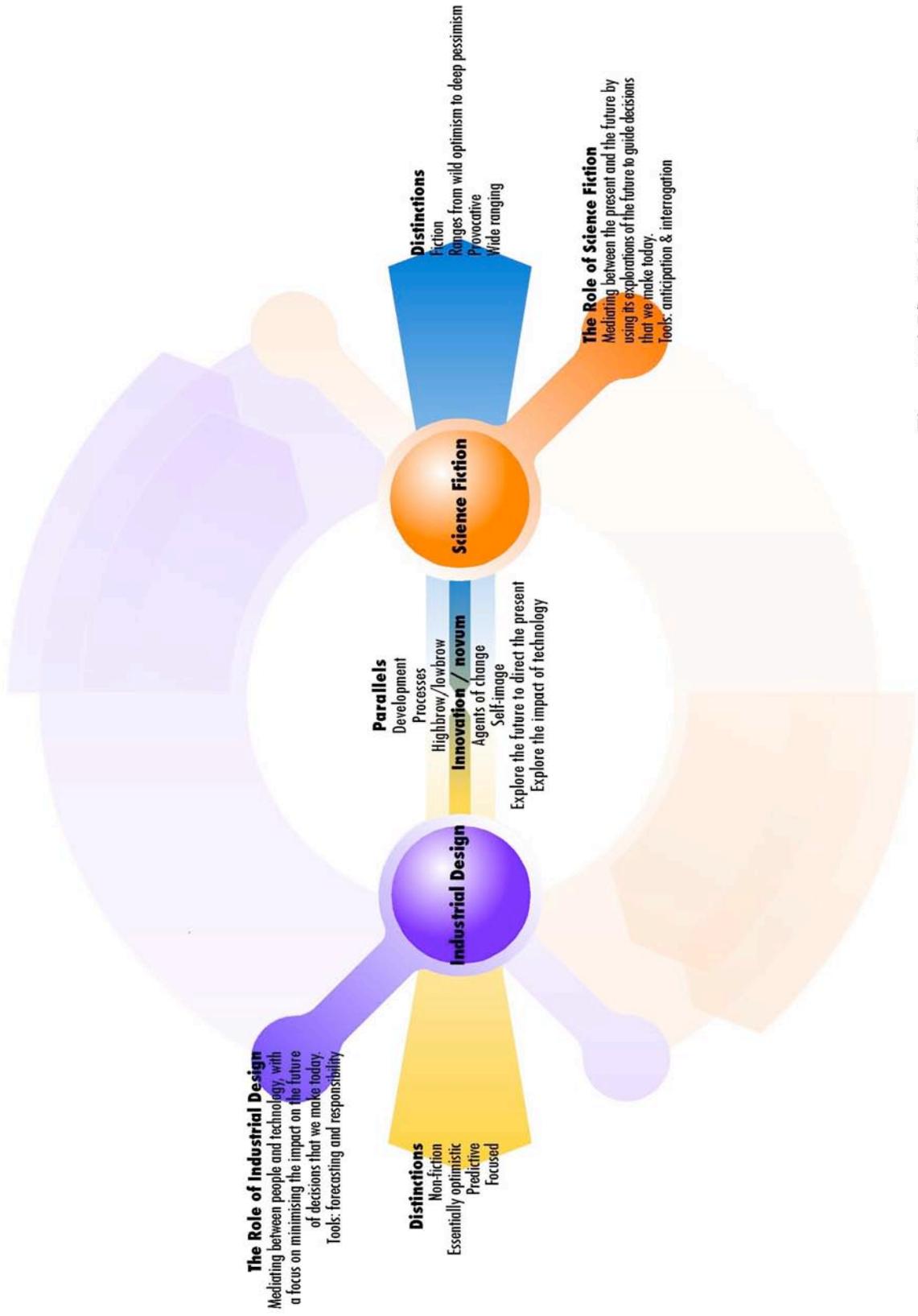


Figure 5.4: The Model (Phase 3)

proposing responses. This range of approaches to the role of science fiction is quite different to those in industrial design.

Science fiction may be highly provocative. Design ranges from the banal to the highly provocative, but the balance or mid-point is different to science fiction: industrial design's link to industry ensures that the focus of design tends towards the commercially viable and physically achievable, while the focus of science fiction tends towards the provocative. There is obviously banal science fiction and provocative industrial design, but these tend to be less common than the mainstream elements.

Industrial design is also far more focussed than science fiction – the role of industrial design is ultimately focussed on specific, achievable, commercial outputs. Science fiction differs wildly, as the sheer range of science fiction media, modes of operation, and types of narratives vary far more widely than industrial design.

5.10 The Model (Phase 4)

When science fiction is filtered through an understanding of industrial design, the literature shows that there are obvious industrial design ideas in science fiction. These ideas are added into the model, and connect clearly with the role of industrial design. The industrial design in science fiction can be seen in the texts (the outputs and objects themselves) and also in the subtexts (the implicit ideas).

Phase 4 of the model in on page 137.

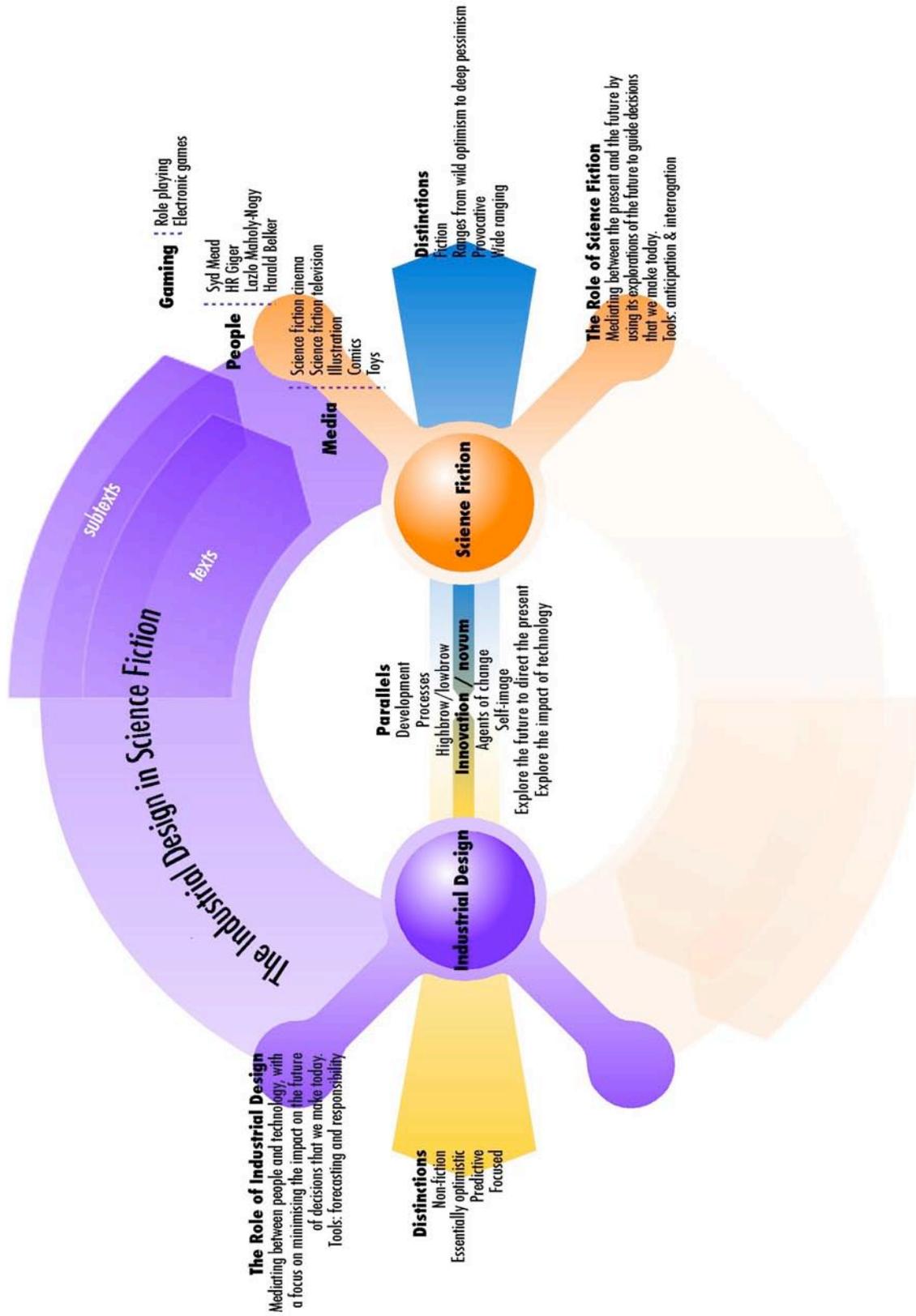


Figure 5.5: The Model (Phase 4)

5.11 *The Industrial Design in Science Fiction*

5.11.1 Description

Section 5.6 identified areas where science fiction and industrial design do the same things for the same reasons. This study suggests the phrase *the industrial design in science fiction* to describe areas where industrial design (both as activity and as profession) contributes to science fiction. This is where science fiction either uses industrial design, or gives the impression of being industrial design.

As noted in the previous section, the industrial design in science fiction is visible in two ways:

1. Texts (industrial design imagery and processes in science fiction media);
2. Subtexts (industrial design ideas and intents in science fiction media and processes).

It is difficult to draw a clear boundary between the texts and subtexts and there is some overlap between the two.

Texts

Media: toys, comics, illustration, television, cinema.

People: Syd Mead, H.R. Giger, Harald Belker.

Subtexts

People: The work of Lazlo Maholy-Nagy in science fiction cinema

Gaming: electronic gaming, role-playing.

Other areas that integrate industrial design and science fiction themes include music videos and television advertisements. However, their primary intent is something other than either industrial design or science fiction, which leaves them at the periphery of this study.

5.11.2 Texts

5.11.2.1 Toys



Figure 5.6
Lego's Bionicle toys are science fictional in appearance, and employ a complex backstory to enhance gameplay. [16bit.com, http://www.16bit.com/toypics/bionicle/vorabk/vorabk-front-full.jpg](http://www.16bit.com/toypics/bionicle/vorabk/vorabk-front-full.jpg)

The industrial design elements in science fiction toys can be substantial. Toys tend to represent either iconic designs from movies or television programmes, or attempt to create a consumer demand by connecting new toys with a movie (widely referred to as merchandising). While toys are not necessarily science fiction in themselves (in reality, they are designed around very pragmatic criteria) the imagery is often based on science fiction ideas.

5.11.2.2 Illustration

Science fiction illustration has a complex interaction with industrial design. The designed objects and design ideas represented in illustrations are often provocative and realised in some detail. However, it is only those illustrations tied to a specific narrative that (together with the narrative) step outside the inherent limitations of two-dimensional media and describe the complexity of the object in three dimensions and in function. Science fiction illustration is also an area where nice, neat conclusions can be drawn about design and science fiction, based on both the design elements in illustrations and also on the characteristics of the media (Westfahl, Slusser, & Plummer, 2002)

Westfahl has proposed a chronological linking of science fiction illustrations with concurrent technologies and attitudes to technology (Westfahl, in Westfahl, Slusser, & Plummer, (2002)). This is an approach that resonates with some of the areas within this study, and one of the areas that could be explored is the relationship between industrial design and illustration. However, while some aspects of science fiction illustration are of interest, the restriction of much illustration to *representing* industrial design rather than being industrial design itself restricts its value to this study.

5.11.2.3 Cartoons / comics / graphic novels

Cartoons and graphic novels frequently bear the hallmarks of a science fiction / industrial design crossover, although a substantial culture has developed around cartooning that has little to do with either. Like illustration, the literal two-dimensionality and size of cartoons and comics limit the

application of industrial design ideas, but comics in particular can add a narrative and time-based component that separates the media from illustrations not connected to a narrative. However, few if any iconic objects have been born from comics in the same way as science fiction cinema and television.

5.11.2.4 Television Programmes

The impact of industrial design on small-screen science fiction has been substantial in two specific instances but is mostly limited. The iconography of *Star Trek* has achieved some visibility (the spacecraft *Enterprise*, phasers and communicators), and there have been other products associated with programmes such as the BBC's *Doctor Who*. Overall, the size of the image and the length of the commercial hour limit the impact of science fiction objects on television.

Another aspect of this study that could be taken further is the question "how many budding industrial designers sat in front of the television in the late 60s entranced by Gerry Anderson's *Thunderbird 2*?" Sci-fi Weekly columnist Sean Huxter observes of *Thunderbirds* that the "*signature vehicles and equipment, and its "fab" designs, are recognised almost everywhere.*" (Huxter, n.d.a. www.scifi.com.sfw/current/cool.html).

5.11.2.5 Cinema

In the previous chapter it was argued that science fiction cinema is the most visible example of industrial design in science fiction. Given the sheer visibility of science fiction themed movies (see Section 4.7.1) and the density of the production design for some of them, it appears that not only is industrial design important to science fiction cinema, but it is highly likely that the inverse is true.

One of the strengths of science fiction cinema is the ability to create worlds with far greater visual richness than is possible in science fiction literature. It is inevitable that cinema reflects contemporary culture (Sobchack, 1987), and design is an aspect of culture deliberately constructed within the movie world. The broad influence of design is evident in science fiction cinema right from

the earliest movies. *Things to Come* exhibits the influence of the Bauhaus, Normal Bel Geddes, Le Corbusier and Lazlo Maholy-Nagy (Landon, 1992), while contemporary movies such as *Minority Report* and *I, Robot* use industrial design's forecasting processes as a key element in the development of their production design content (see Section 4.7.2).

Industrial design also contributes to science fiction cinema through the use of industrial designers in the development of production design for specific movies. Three people trained as industrial designers have generated high-profile designs for high-visibility science fiction movies.

- Syd Mead: *Star Trek: The Motion Picture* (dir. Wise, 1979), *Tron* (dir. Lisberger, 1982), *Blade Runner*, *Strange Days* (dir. Bigelow, 1995), *Aliens* (dir. Cameron, 1986), *Short Circuit* (dir. Badham, 1986), *Mission to Mars* (dir. De Palma, 2000), *A Sound of Thunder* (dir. Hyams, 2005)
- H.R. Giger: *Alien* (dir. Scott, 1979), *Species* (dir. Donaldson, 1995)
- Harald Belker: *Armageddon* (dir. Bay, 1998), *Battlefield Earth* (dir. Christian, 2000); *Spiderman* (dir. Raimi, 2002), *Minority Report* (dir. Spielberg, 2002), *Serenity* (dir. Whedon, 1995), *Zathura*. (dir. Favreau, 2005).

Another influence of design on science fiction cinema is through the development of special effects, which are often sub-contracted to third-party special effects houses who employ designers (as well as many other personnel). The dialogue between special effects technology and design is another aspect of the science fiction / industrial design relationship that could be investigated.

The relationship between industrial design and science fiction cinema is explored in more depth in Chapter 6.



Figure 5.7
Industrial designer Syd Mead has created many of science fiction cinema's memorable design icons. He also designed the robot 'Number Five' from *Short Circuit* (dir. Badham, 1986). *Johnny-Five.com*, <http://www.johnny-five.com/images/sc/scenes/5robots.jpg>

5.11.2.6 People

- Syd Mead: Mead, noted in Section 5.2.2, has a significant profile with industrial designers, and equally has a reputation in the science fiction community owing to his work on several key movies. As the influence of



Figure 5.8

H.R. Giger's iconic creature designs for *Alien* (dir. Scott, 1979) are based on his disturbing artworks that fuse humanoid, insect and mechanical elements. *Giger.com*, <http://www.giger.com/Home.jsp>



Figure 5.9

Harald Belker's high-profile design of a new Lexus vehicle designed for Spielberg's *Minority Report* (2002) has received some publicity. *Seriouswheels.com*, <http://www.seriouswheels.com/pics-jkl/Lexus-Minority-Report-2054-Concept-FA-1280x960.jpg>



Figure 5.10

Lazlo Maholy-Nagy's design of the city of Everytown for the 1936 movie *Things to Come* (dir. Menzies) shows a strong connection with the architecture of Le Corbusier (*Image capture, dir. Menzies, 1936*).

Mead's work is significant, his work and his approach to it is discussed in Chapter 6.

- H.R Giger: Giger's work is a complete contrast to Mead's. While Mead describes his work and approach to design as "*optimistic*" (Mead, personal communication, 2005: appended), Giger's work is considered dark and disturbing. His design of environments, objects and creatures for *Alien* is based on what he describes as a 'biomechanoid' (Kim, in *Entertainment Weekly*, October 98. p. 33) – a fusion between machine and organism (Figure 5.8). His use of sexual metaphors and the imagery of genitalia in his designs can be read as misogynistic (Kuhn, 1990). While his work has gained him notoriety in some circles, generally the direct influence of his work - despite its visibility - is limited.
- Harald Belker: Belker trained at the Art Center College of Design in Pasadena, and has designed products for a number of science fiction movies including *Battlefield Earth*, *Minority Report*, and *Serenity* (Belker, 2006). His designs for the Lexus and other vehicles for *Minority Report* have given Belker a profile with industrial designers but not in science fiction circles.

5.11.3 Subtexts

5.11.3.1. Lazlo Maholy-Nagy

Maholy-Nagy was appointed as a tutor at the Bauhaus between 1923 and 1928. His direct influence on the industrial design in science fiction is limited to the design of the influential sets for the 1936 science fiction movie *Things to Come*. Based on the H.G. Wells novel *The Shape of Things to Come*, the latter part of the movie is set in a post-apocalyptic world run by benevolent technocrats. Maholy-Nagy designed the city of the future inhabited by the technocrats in the Moderne style. This set has been identified by both Bush and Plummer as a positive influence on the development of the Streamlined Moderne architectural sub-style (Bush, 1975; Plummer, in Westfahl, Slusser & Plummer, 2002)

5.11.3.2 Gaming

The industrial design aspects of gaming almost entirely hinge on science fiction electronic games such as *Doom* (Carmack 1992), *Homeworld* (Relic Entertainment, 1999) and *Halo* (Bungie Studios, 2003). These games certainly look like science fiction, and the design content is substantial. *Halo* in particular is full of science fiction imagery: the title of the game refers to a vast artificial world in the shape of a ring – a concept initially popularised by Larry Niven in the science fiction novel *Ringworld* (1970).

Some of these games have strong science fiction ideas at the core of the story that the game is constructed around. However, the focus in gaming is the gaming experience rather than the design experience, and as the level of interaction between the objects is controlled by the pace and intent of the game, ultimately the design content is similar to that of illustration – interesting, possibly provocative, but ultimately lacking the level of definition that would make it central to this study.

5.12 *The Model (Phase 5)*

In the same way that industrial design is visible in science fiction, science fiction is visible in industrial design. This aspect of the relationship can also be broken down into texts and subtexts. Like the other side of the model, there is some overlap between texts and subtexts.

Phase 5 of the model is on page 144.

This connection completes the model.

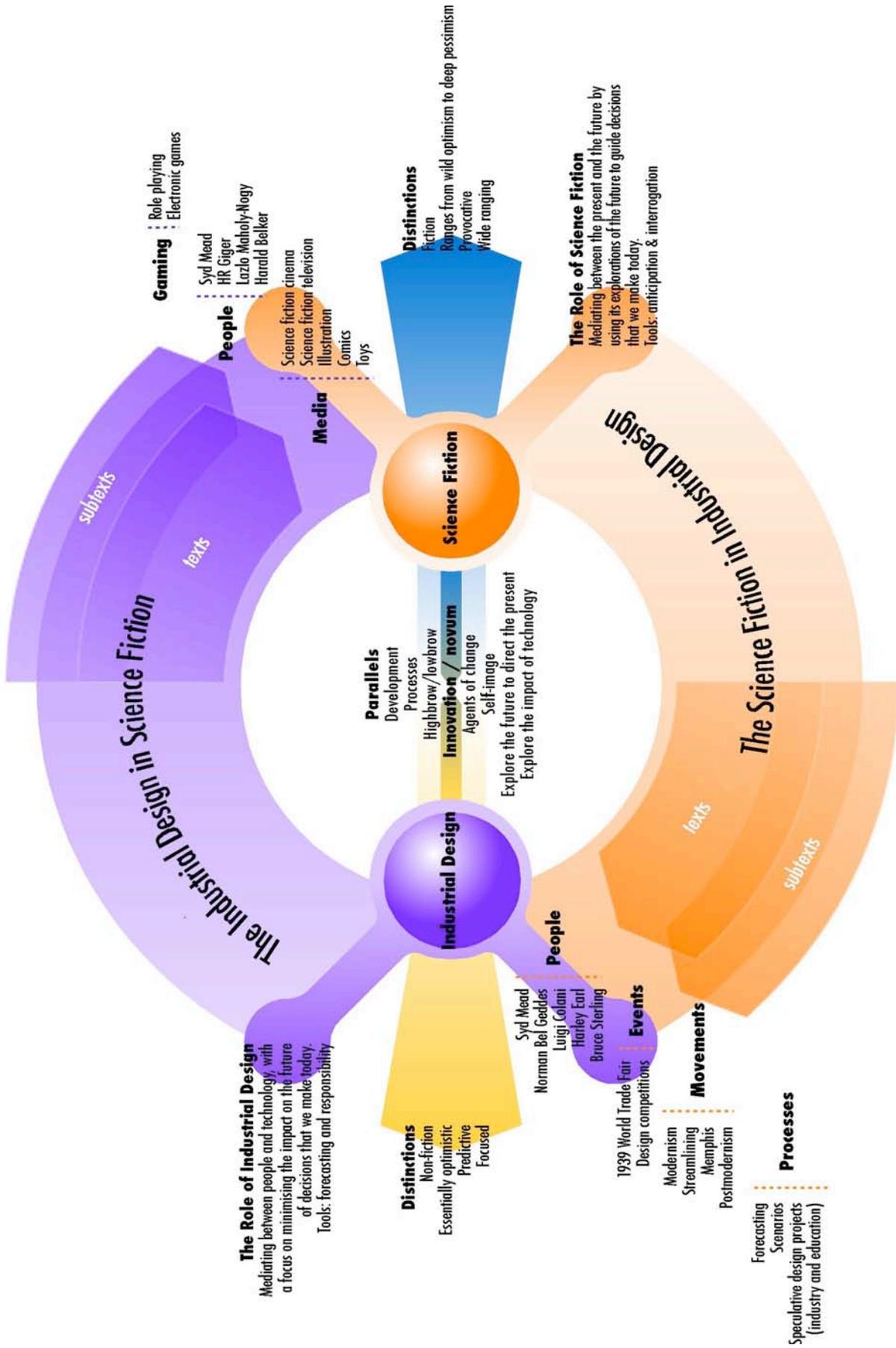


Figure 5.11: The Model (Phase 5)

5.13 *The Science Fiction in Industrial Design*

5.13.1 Description

This section discusses examples of the science fiction in industrial design – the areas, activities and products that show industrial design using science fiction thinking. The examples used to illustrate this aspect of the relationship have been selected for their clarity, and are not the only examples that could be used. The science fiction in industrial design is visible in two ways:

1. Texts (science fiction imagery and processes in industrial design products);
2. Subtexts (science fiction ideas and intents in industrial design processes and ideas).

It is difficult to draw a clear boundary between the texts and subtexts and there is some overlap between the two.

Texts

People: Syd Mead, Norman Bel Geddes, Luigi Colani, Bruce Sterling, Harley Earl.

Events: 1939 New York World Trade Fair, design competitions.

Movements: Streamlining.

Subtexts

Movements: Modernism, Memphis, Postmodernism.

Processes: Forecasting / scenarios, speculative design projects (industry and education).

5.13.2 Texts

5.13.2.1 *People*

As discussed in Section 5.11.2, the predictive and speculative work of designers such as Norman Bel Geddes, Luigi Colani and Syd Mead connects very strongly with science fictional ideas and outcomes. These three designers work with similar themes, and while the ideas in Bel Geddes' body of work is clearly seen in hindsight (and is connected with a set of ideas that



Figure 5.12
Norman Bel Geddes speculative flying wing design (1929) inspired some of the production design for *Things to Come*. Politecnico di Torino,
<http://www2.polito.it/strutture/cisda/HvbArch/resolutionaliner3.jpg>

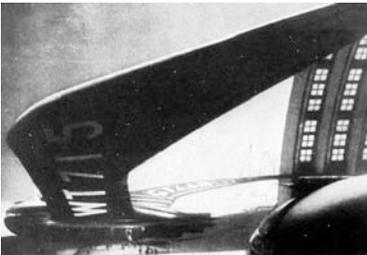


Figure 5.13
Flying wing design from *Things to Come*.
(Image capture, dir. Menzies, 1936)



Figure 5.14
Luigi Colani produces designs that give the impression of being science fiction. His prototype truck design for Mercedes could have been part of the production design for *Minority Report*. bangertinternationa,
<http://www.bangertinternational.de/bangert/colani/images/images.php>

could be considered irrelevant), Mead and Colani are still practising and are representing contemporary industrial design ideas. These three designers all work with ideas that are intended to be predictive or provocative (not always the same thing) and are largely science fictional in their speculations about technology, function and culture.

- Norman Bel Geddes: Bel Geddes was a major proponent of Streamlining and was responsible for many of the movement's more memorable objects (see Section 3.5). Of particular interest is Bel Geddes' work on the Futurama exhibit for *General Motors* at the 1939 World Trade Fair in New York, and his influence is also clearly evident in the aircraft designed for the 1936 movie *Things to Come*. His speculative aircraft in Figure 5.12 clearly gives the impression that this is a science fiction object
- Syd Mead: Mead was discussed in Section 5.11.2. His publication *Sentinel* has inspired two generations of industrial designers (Mead, personal communication, 2005) and has been reinforced by a steady stream of similar books. His production design work for key science fiction movies has also been influential with industrial designers (see Section 6.3 for further discussion).
Luigi Colani: Colani is a Swiss designer whose introduction to design was through his background in aerodynamics (*Visions in Design*, www.colani.ch/frames.htm, retrieved 15.6.06). Colani's work parallels that of Bel Geddes in many ways, although he has only achieved limited recognition (de Noblet, 1993). While the majority of Colani's work is conceptual rather than pragmatic, like Mead he has had a substantial influence on industrial design students, and his transport designs resonate with the boundary-pushing forms of Bel Geddes. His conceptual design proposal for *Canon* cameras is credited with a paradigm shift in the design of single-lens reflex cameras in the 1980s (de Noblet, 1993).
- Bruce Sterling: Sterling is an interesting and currently unique example of the potential in the industrial design / science fiction relationship. A leading cyberpunk science fiction author, Sterling has for some years promoted the Viridian design movement, based on ideas of responsibility



Figure 5.15
Harley Earl's *Cadillac* El Dorado
fuses aeronautical and science fiction
imagery.
Fiell & Fiell, 2000. p. 197

and sustainability. For the 2005/06 year, he was 'Visionary in Residence' at the Art Centre design school – a clear instance of what science fiction has to offer industrial design (Sterling, 2005b). Sterling is discussed in more detail in Chapter 6.

- Harley Earl: The work of *General Motor's* designer Harley Earl from 1930 to 1960 also connects with science fiction, but at a different level than the work of Bel Geddes, Mead and Colani. Earl used overt science fictional imagery in many of his car designs, imagery based strongly on cartoons such as *Flash Gordon* and *Dan Dare* as well as elements from military aircraft (Brosterman, 2000). While the vehicles became iconic, (Figure 5.15) their use of futuristic imagery was also calculating and cynical. At a deeper level these vehicles also exemplified exactly the questionable aspects of consumerism that science fiction was later to become preoccupied with (Papanek, 1974).

5.13.2.2 Events

1939 World Trade Fair

The 1939 World Trade Fair was an event that both gave the *impression* and *sensation* of being science fiction. Designed and constructed on waste grounds in New York, the Fair was subtitled '*The World of Tomorrow*'. The Fair featured exhibitions designed by mainstream industrial designers Raymond Loewy, Henry Dreyfuss, and Norman Bel Geddes, and industrial designer Walter Dorwin Teague was on the committee that steered the event (Meikle, 2001). Much has been written about the 1939 World Trade Fair – both about the Fair itself and also what it symbolised. As a focus of industrial design and the streamlining movement, the event encapsulated everything that the American industrial design profession was striving to achieve. Woodham notes, "*on display were numerous examples of science fiction as populist entertainment.*" (Woodham, 1997. p. 72).

Bel Geddes' Futurama diorama for *General Motors* showcased his vision of the America of the 1960s, with vehicles, buildings and motorways designed by Bel Geddes and his team, and was the central attraction of the fair (Meikle, 2001). The diorama was a huge undertaking, constructed almost

entirely to the vision of Bel Geddes who matched the design of the exhibit to the desire of *General Motors* to be seen as a benevolent partner in the expansion of the nation. Seated visitors swooped around the diorama on conveyer belts, listening to a voice-over narration. At the conclusion of the ride, the visitors alighted on a full-scale street corner to sample the vehicles that General Motors wished the public to drive towards Bel Geddes' golden vision (Meikle, 2001). The Futurama exhibition was a significant success for Bel Geddes and *General Motors*: it connected with science fiction in both the way that an attempt was made to predict the future and in the way that it was experienced.

Loewy's *Rocketport of the Future* exhibit also looked like science fiction. His animated model suggested that spaceflight would become a reality using the same 'space gun' technology proposed by science fiction authors Jules Verne and H.G.Wells (Meikle, 2001).

In his book *Style in Product Design*, Graham Vickers comments, "*the architecture and some of the other visual conceits of the fair could never hope to be more than well-informed science fiction*" (Vickers, 1993. p. 34). This study contends that this observation demonstrates a lack of understanding of both industrial design and science fiction.

The 1939 World Trade Fair is included in virtually every history of industrial design, and was clearly an iconic event in the development of the profession. This study also identifies the Fair as an event that demonstrated the overlap of the roles of industrial design and science fiction.

5.13.2.3 Design Competitions

Many design competitions ask for science fictional outcomes. Design competitions are typically intended to identify the sponsors with a target market, giving them the opportunity to promote an image of themselves that is aligned with the theme of the competition. Examples of science fiction oriented design competitions include:

- Ducati Motorcycles: *Design your dream Ducati* (2003) – many of the design proposals are science fictional in appearance, intent and

character. Many designs would be difficult or impossible to realise given current technology, and require some as yet unexplored technical advance to be able to produced. Many of the designs give the impression of being science fiction.

([http://www.ducati.com/design/index.jhtml;\\$sessionId\\$FS525PAAAASTOCRMKMQSFFQKFRJSCIV3](http://www.ducati.com/design/index.jhtml;$sessionId$FS525PAAAASTOCRMKMQSFFQKFRJSCIV3))



Figure 5.16
The winner of the 2001 LG Electronics Bridging the digital and the human competition used emerging electronic product technologies as the basis for his design.

LG Electronics,
http://www.lge.com/about/design/competition/design_competition_2001_gra

- LG Electronics: Bridging the digital and the human (2001) – implicit in the written briefing and explicit in the verbal briefing for the competition was the aim of designing products that could conceivably be manufactured in five years, and that new / emerging technologies should be applied to these design issues. Not only does the theme give the *impression* of being science fiction (implying a connection between the actual and the virtual), many of the submissions applied science fiction ideas in their forecasting of new technologies and how they might be applied to product design. (www.lge.com/about/design/competition/design_competition)

5.13.3 Subtexts

5.13.3.1 Movements

- Modernism: Modernism has been simply described as a belief in progress (Sobchack, 1987) allied with a disconnection from historical precedents. Seen in their contemporary context, the products of modernist designers and architects would have looked like science fiction. Modernism displayed a faith in the ability of design to bring about a better future (Woodham, 1997), and this intention is much the same as that of science fiction. However, Modernism also brought with it an attitude that the designer knew best, and that minimalism and absence of decoration was what everyone should strive for (de Noblet, 1993).
- Streamlining: The Streamlining movement inspired objects that were not only industrially designed but were science fiction at the same time. This study suggests that the Hotchkiss stapler had no reason to look like it was intended to move through the air with a minimum of resistance (obviously fiction) but its philosophical basis was a representation of faith

in technological progress (science). The imagery of flight that was co-opted into product design easily conflates with science fiction imagery.

- Memphis: The Memphis movement employed - among many other things - science fiction imagery, as well as operating in a provocative way that parallels science fiction. The *Casablanca Cabinet* by Ettore Sottsass (one of the movement's iconic pieces) references both popular culture and science fiction with the inclusion of an icon from the original science fiction themed 'Space Invaders' video game in the top of its carcass (de Noblet, 1993; Woodham, 1997).
- Post modernism: Post-modernism is not necessarily something as formal as a 'movement', but encompasses a range of reactions to the ideas of Modernism (Press & Cooper, 2003). Post-modernism celebrates contemporary culture rather than attempts to direct it as Modernism did. It is the recognition of culture that connects post-modernism with a number of science fiction themes. Some of this attitude is evident in *Where's My Space Age?* (Topham, 2003), where imagery from the space programme is reinterpreted through avant-garde fashion, architecture, and, in a limited way, through industrial design.

5.13.3.2 Processes

Speculative design projects

The development of provocative, speculative designs for the promotion of new or promising processes, materials or technologies, or the design of self-promotional products by design consultancies all show industrial design operating in the same way as science fiction.



Figure 5.17
Peugeot's 4002 (2003) concept car
could easily have sat alongside
Harald Belker's *Lexus* design in
Minority Report.
Bienvenidos a Peugeot Honduras
http://universalautomotriz.com/downloads/4002_cc.jpg

Show cars can be seen as an example of science fiction in this context. They are not science fiction objects in themselves, but they demonstrate industrial design creating the future. Show cars are non-functional full-size models of cars, unveiled at automotive events to generate responses to possible directions in styling or function. The 'show car' is a typical tool of the automotive trade - they are understood by the press and the public as tests for possible directions in car design. Some show cars may be very realistic and intended for production in the near future if reception is positive: others may be pure styling exercises or intended to titillate viewers with possible

technologies (de Noblet, 1993; Burdek, 2005). This study suggests that the provocative nature of these design projects connects very directly with science fiction, both in the way that the manufacturers use the projects, and in the way observers receive them.

Forecasting / Scenarios

Industrial design research processes have already been discussed in some depth in Chapter 4. Forecasting processes show industrial design doing exactly the same things as science fiction, for more or less the same reasons: to use explorations of the future to guide decisions that we make today. This study has clearly linked the use of scenarios as a forecasting tool with science fiction, as the creating of a useful scenario has many similarities to 'world-building' for a fictional narrative.

5.14 Cause and Effect

This study proposes a further aspect of the relationship between industrial design and science fiction. This is 'cause and effect', where science fiction is directly influenced by industrial design and where industrial design is influenced by science fiction.

Two groups of ideas clearly demonstrate 'cause and effect' as a cycle. These are not the only examples, but they are the clearest. The first relates to Streamlining; the second to science fiction cinema. While Streamlining is essentially an historical issue, science fiction cinema is both historical and contemporary.

5.14.1 Streamlining

Streamlining as a design movement has already been discussed in this thesis, as the movement appears as a peculiar, historical nexus of industrial design and science fiction. Both the imagery of the Streamlined products

themselves and the ideas behind the imagery appear to demonstrate some sympathy with science fiction.

While Streamlining as an historical phenomenon might seem to be of limited relevance, Castelli, author of *Transitive Design*, feels that the period of streamlining (culminating with the 1939 New York World Trade Fair) has a certain resonance with contemporary design ideas:

The attraction to those years, which represent a seminal though uncertain period in the history of design, is the result of the attitude of looking at the future with the same visionary 'short-term' pragmatism that is so widespread today. (Castelli, 1999. p. 26)

Many of the provocative objects designed by Bel Geddes during the Streamlining period have been discussed in this study and give the impression of being science fiction. They demonstrate the role of both industrial design and science fiction, exploring the future with the aim of influencing decisions in the present day. Bel Geddes' influence is seen in both science fiction cinema and illustration, both areas responding to the same roots as Bel Geddes, and reflecting some of his work. This is industrial design contributing to science fiction.

Streamlining and its associated Moderne style are evident in concurrent cinema, cartooning and illustrations. In his book *'The Streamlined Decade'*, Donald Bush connects imagery in the *Buck Rogers* and *Flash Gordon* comic strips with subsequent Moderne architecture and interiors (Bush, 1975). Kathleen Church Plummer makes a similar connection in her chapter in Westfahl, Slusser and Plummer's *Unearthly Visions* (2002), although she expands the palette of science fiction influences to include the movie *Things to Come* and illustration. This is science fiction contributing to industrial design.

The study proposes that these events are related in a clear cause and effect cycle.

5.14.2 Science Fiction Cinema

As noted in 5.10.1, the industrial design content of science fiction cinema is an important element of many science fiction movies.

In his book *'Style in Product Design'*, Graeme Vickers observes that "(r)eceived images of 'futuristic' lines have long been conditioned by cinema imagery, from Fritz Lang to Ridley Scott." (Vickers, 1993. p. 3). Industrial designer Syd Mead (whose contributions to industrial design and science fiction cinema were noted in Section 5.13.2) was one of the major influences on the production design of Ridley Scott's movie *Blade Runner*. Mead's ability to contextualise his designs has been a major contribution to the movie productions he has worked on.

Mead is one person who is conspicuous on both sides of the industrial design /science fiction model. His design processes share as much with science fiction's world-building as with industrial design's forecasting methods.

Some industrial designers have been inspired to train as designers by the production design of science fiction movies. In a discussion forum on the industrial design student website www.core77.com, at least three of the 70 respondents stated that science fiction movies were responsible for their choice of industrial design as a profession (*Design on Film*, <http://www.core77.com/chit-chat/film.html>). One person (with English as a second language) was more specific, and said "*I owe it to Mr. Mead be an industrial designer.*" This thread is discussed in more detail in Chapter 6.

The study proposes these events as a clear cause and effect relationship.

As both science fiction cinema and Syd Mead are important elements of the industrial design / science fiction model, they are discussed in more detail in Chapter 6.

5.15 Summary

There is some material in the literature review that *demonstrates* the overlap between industrial design and science fiction. This chapter analyses what has been discussed through the literature review, and outlines a coherent graphic model that is the basis of a theory for this topic.

The graphic model highlights four aspects of the relationship between industrial design and science fiction that are of interest to this study. The first is the area in the middle of the model where industrial design and science fiction parallel each other. The roles of each area are very similar, and show industrial design and science fiction doing the same things for the same reasons. (There are other areas where industrial design and science fiction are very different.)

The second area of interest is the 'the industrial design in science fiction', where industrial design ideas and products are evident in science fiction texts and subtexts. This includes science fiction cinema, television, toys, illustration, and gaming.

The third area is 'the science fiction in industrial design', where industrial design texts and subtexts that work with science fiction ideas and processes can be identified.

The final area of interest is the proposal of a cause and effect elements in the industrial design / science fiction relationship, exhibited in (but not limited to) Streamlining and science fiction cinema.



Chapter 6: Case Studies

6.1 *Introduction to the chapter*

This chapter brings together the themes identified in the previous three chapters, and applies the case study method discussed in Chapter 2: Research Methods. The evidence in these case studies expands on the industrial design / science fiction relationship, demonstrates how some of the ideas in the hypothesis are evident, and illustrates the relevance of the model that was constructed through the previous chapter. Of the three case studies, the first two examine people who are working in the industrial design / science fiction nexus, and show completely different approaches to the area. These two case studies support the hypothesis that science fiction has something to offer industrial design. The third focuses on industrial design and science fiction cinema.

Each case study was selected on the basis that it clearly supported and illustrated the hypothesis, demonstrated elements of cause and effect, and expanded on the roles of both industrial design and science fiction.

Syd Mead – an industrial designer, and the subject of the first case study – works on both large-scale industrial design projects, and on science fiction movies. The information on Syd Mead was assembled from his many interviews, and also from Mead's response to a set of questions developed specifically as part of this study.

The second person and subject of the second case study, Bruce Sterling, is one of the leading authors from science fiction's cyberpunk movement. In 2005-06, Sterling was Visionary in Residence at the Art Center College of Design in Pasadena, California. His journey to this position is the result of two things:

- Sterling's instigation of the Viridian design movement ('Viridian' being a shade of green), which discusses the impact of greenhouse gas emissions within a design and technology context;
- The themes that he has been developing in his science fiction writing.

These two people represent one important aspect of this study: how science fiction excites and inspires industrial designers and what science fiction can contribute to industrial design.

The third case study investigates science fiction cinema in some depth and from two different directions. Firstly, the larger issues that connect industrial design and science fiction cinema are discussed, and several ways of approaching and understanding the role of design in science fiction cinema are proposed. The ideas presented through this section of the thesis are generally original to this study. These ideas are then illustrated within the context of three movies.

This forms a substantial proportion of this chapter, based on:

- The significance of science fiction cinema to industrial design (discussed in Section 4.7.1 and in the first case study in this chapter)
- The importance of industrial design to science fiction cinema.
- The visibility of the roles of both industrial design and science fiction in science fiction cinema.

The second part of the science fiction cinema case study is an analysis of a discussion thread from an industrial design website: the discussion was around the question "*what is the best industrial design film of all time?*". The conclusions that can be drawn from this discussion also support aspects of the hypothesis, and additionally relate to the cause and effects concept discussed in the last section of the previous chapter.

All the supplementary study questions are addressed in this chapter. The material in this chapter is largely based on the literature review, supplemented with analysis of a web-based discussion forum and an email interview.

6.2 Literature Review

6.2.1 Introduction to the literature review

This chapter uses a few resources that have not been noted earlier in the study. One online discussion is analysed in Section 6.6.4.

In the first instance, the literature review looked for information that would define what the appropriate case studies were. The second aim was to find material to support the case studies.

Most of the science fiction media books in the Literature Review in Chapter 4 are relevant to this chapter. These books are:

- *The Aesthetics of Ambivalence: Rethinking Science Fiction Film in the Age of Electronic (Re)Production* (Brooks, 1992).
- *Alien Zones 2: The Spaces of Science Fiction Cinema*. (Kuhn (Ed.), 1999).
- *Screening Space: The American Science Fiction Film* (Sobchack, 1987).
- *Science Fiction Cinema* (Tellote, 2001).

6.2.2 Key texts

- *Syd Mead's Sentury* (Mead, 2002)

Syd Mead is the subject of one of the three case studies in this chapter. His book *Sentinel* was part of the Literature Review for Chapter 5, as it demonstrates industrial design and science fiction as one seamless identity. *Syd Mead's Sentury* is his most recent publication.

Thematically, very little has changed in Syd Mead's world since the publication of *Sentinel* in 1979: *Sentury* includes a variety of concepts for electronic games, theme parks, and movies. *Sentury* does include more of Mead's concept development work, and text accompanies most of the images. Of several movie proposals, only one has made it to the big screen – the 1999 movie *Mission to Mars* directed by Brian de Palma. The most

unusual single project in the book is a design proposal for the interior of the Sultan of Brunei's personal Boeing 747 jet.

Mead's rendering skills have broadened into the exploration of digital media, but otherwise this latest book suggests that it is business as usual for Mead: he still works with explicit science fiction themes woven through his design and illustrative work. This means that Mead remains central to this study, and that his work clearly shows the synergy between industrial design and science fiction.

- *Special Effects: the History and Technique* (Rickitt, 2000)

Special Effects charts the development of special effect technologies and the movies that employ them. While many non-genre films employ special effects, there is an inevitable connection between science fiction and fantasy films, and the ability of special effects technologies to deliver images of things that current don't exist. Science fiction movies, therefore, are heavy users of special effects technologies, and the genre features regularly through this book.

The book highlights the way that special effects both limit what is possible to achieve, and how the demands of specific movies have forced the development of new technologies that can deliver the visions of the production team. For example, Rickitt identifies the original 1977 *Star Wars* production (dir. Lucas, 1977) as the source of computer-controlled camera control technologies that are now commonly used to create composite live action / virtual background sequences. While any book cannot hope to keep abreast of developments in digital techniques, *Special Effects* is a valuable resource owing to its depth of understanding of special effects processes, and because of the overt connection it makes between production design and special effects technologies.

- *Science Fiction in the Cinema* (Baxter, 1970)
- *Future Tense: the Cinema of Science Fiction* (Brosnan, 1978).
- *The Rough Guide to Sci-fi Movies* (Scalzi, 2005).

John Baxter and John Brosnan's books are regularly cited as important publications in the analysis of science fiction cinema (for example, Landon, (1992)).

Baxter's *Science Fiction in the Cinema* is seen as the first book to seriously discuss science fiction cinema. The book is structured both chronologically and thematically, and ties together the narratives and ideas portrayed in science fiction movies with observations about contemporary culture.

Brosnan's *Future Tense: the Cinema of Science Fiction* is similar in structure and treatment to Baxter, but the nine years between the publication of the two books saw a significant growth in science fiction cinema and Brosnan's book exhibits a wider sense of the role of special effects. Both books informed the background understanding of science fiction cinema required for this study.

Published in 2005, John Scalzi's *The Rough Guide to Sci-fi Movies* provides a contemporary overview of the genre. It obviously includes many newer movies that the older publications do not, and discusses current preoccupations in science fiction cinema. This includes virtual realities, gender issues, and the state of the art in special effects technologies.

The Rough Guide to Sci-fi Movies notes the emergence of movie-making around the globe, including Canada, India, the Far East, and Australasia as one consequence of the development of digital special effects technologies is the decentralisation of special effects sub-contractors from the traditional movie-making centres. *The Rough Guide to Sci-fi Movies* provides a contemporary view of the genre that is useful to the analysis of science fiction cinema in this study.

- *From Star Wars to Indiana Jones: the Best of the Lucasfilm Archives* (Cotta Vaz & Hata, 1994).
- *Star Trek The Next Generation: Sketchbook - the Movies 'Generations' and 'First Contact'* (Eaves & Dillard, 1998).

These books focus on the production design processes of specific movies, and demonstrate a significant overlap with industrial design processes.

The six movies included in *From Star Wars to Indiana Jones* predate digital special effect technologies, and show how the 'traditional' use of models, blue-screens and matte backgrounds limits what can be achieved in terms of the production design itself. *Star Trek The Next Generation* shows how the two movies *Generations* and *First Contact* employ both traditional and digital technologies. Both books, however, are full of drawings in traditional sketching media as well as the use of large-scale models both as a design tool and as the basis for filming. It is obvious that sketching remains an important design tool in contemporary production design processes.

These books show how production design processes work in both the digital and pre-digital era, and demonstrate the same design processes at work in industrial and production design.

- *2001: Filming the Future* (Bizony, 1994).
- *Future Noir: the Making of Blade Runner* (Sammon, 1996).

These publications focus on specific films. Both books have been useful to this study, but for different reasons.

Despite the production design being a critical element of the long-term success of *Blade Runner*, only ten pages of the book are about production design processes. However, Syd Mead features heavily in these ten pages, and there is much detail about the processes that Mead used during the development of the movie.

2001: Filming the Future, by contrast, makes much of the production design process of Stanley Kubrick's movie, as well as the application of special effects technologies. However, the most interesting aspect of Bizony's book is the concept that he describes as "*the death of the future*" (Bizony, 1994. p. 160). Here, Bizony argues that *2001: A Space Odyssey* was the last of the optimistic / realistic science fiction movies, and decries later productions such

as *Star Wars* (for its unrealistic and noisy spacecraft, and impossible dogfights in space) and *Blade Runner* (for its vision of a dark rather than shiny future). In design terms, Bizony's 'death of the future' concept is worth exploring further but is outside the scope of this study.

DVDs

The supplementary features on movie DVDs are an information source that relates to the science fiction cinema case study, and have only recently become available. The greater storage capacity of DVDs compared to videocassettes means that there is excess capacity on most discs, and many movies released on DVDs are accompanied by 'special features'. This additional material can include documentaries about the making of the movie and additional soundtracks with commentary from actors and the production team.

These special features are a source of information about movie-making processes, and often focus on the production design and special effects.

DVDs that were valuable for this study include:

- *Aliens. Special edition.* (Cameron, J. (director), 1985)
- *Final fantasy: The Spirits Within. Special edition.* (Sakaguchi, (director), 2001)
- *I, Robot. 2-disc collector's edition* (Proyas, A. (director), 2004)
- *Metropolis. Restored authorised version.* (Lang, F. (director), 1927)
- *Minority Report.* (Spielberg, S. (director), 2002)
- *Serenity. Special edition.* (Whedon, J. (director), 2005)
- *The Chronicles of Riddick.* (Twohy, D. (director). 2004)
- *The Lord of the Rings: The Fellowship of the Ring. Special extended DVD edition.* (Jackson, P. (director), 2001)
- *The Sixth Day. Collector's edition.* (Spotteswoode, R. (director), 2000)

6.3 *Syd Mead*

6.3.1 Overview

As in industrial design, the problem defines the solution... My constraints are always the story, and in the case of classic industrial design, it's pretty much the same. The story becomes the marketing studies or whatever parameters are driving the desired direction toward the solution. (Mead, in Lipper, D. (n.d.). *Painting the future*. http://www.space.com/sciencefiction/movies/syd_mead_000707.html)

Syd Mead sits at the nexus of the relationship between industrial design, science fiction, and science fiction cinema, and represents many of the ideas central to this study. Described as “*one of the most celebrated concept designers of our time*”, he has contributed to the design of several movies that are part of the science fiction cinema canon (Syd Mead, visual futurist. (n.d.). http://www.ballisticpublishing.com/articles/syd_mead/). Because of his work in science fiction cinema Mead has a profile with the science fiction community, and because of his ideas, intuitive understanding of the idea of framework and his rendering skills, he also has a profile with industrial designers. Mead describes himself as a ‘visual futurist’, and this is how he is credited on *Blade Runner* and subsequent movies. All of these issues make Mead and his work an important aspect of this study.

Mead was trained as an industrial designer at the Art Center School in Los Angeles, and subsequently worked for the *Ford Motor Company* as a designer and visualiser, in a role where he was designing the future for the company as part of the Advanced Styling Centre (a provocative rather than predictive role). He has been self-employed as ‘Syd Mead, Inc’ since 1978. His current work includes hotels, video games, theme parks and nightclub interiors in addition to his production design for movies (The Hollywood Reporter, (n.d.). http://www.hollywoodreporter.com/thr/film/feature_display.jsp?vnu_content_id=1001096304).

His books are collections of his illustrative work. Some illustrations are accompanied by descriptions of the processes and ideas exemplified in the work itself. He has also produced four instructional DVDs of his rendering techniques. A synopsis of much of his professional career and a complete list of his publications are available on his website www.oblagon.com.

Mead is a reader of science fiction (Sammon, 1996), and as this study will argue, his interest in science fiction is an integral part of his career trajectory. Much of Mead's illustrative work is speculative and provocative in the way that science fiction is, and many of his renderings exhibit elements of science fiction's sense of wonder. However, it is his ability to contextualise his design work – not only in creating the physical surroundings, but also in connecting the product itself and its surroundings together within a sense of framework – that has led him into production design work on a number of science fiction movies. His published work in *Sentinel* attracted the eye of the production team involved in *Star Trek: The Motion Picture* (dir. Wise, 1979), which in turn caught the attention of the people involved with *Blade Runner* and *Tron* (Peary, 1984). Section 5.11.2 includes a list of movies that Mead has contributed to.



Figure 6.1
Mead fills the backgrounds of his drawings with details that provide a sense of context.
Mead, 1979, p. 107



Figure 6.2
Mead's early drawings of the Spinner car concept. *Bladezone*, http://media.bladezone.com/contents/ffilm/production/props/lostandfound/spinner2/images/spinner_drawing_sydmead_3.jpg

Mead's ability to develop contexts led directly to his deep involvement with director Ridley Scott on *Blade Runner*. Mead was asked initially to design one of the 'hero' vehicles, subsequently called a 'spinner'. Mead envisaged the spinner to be an aerodyne (similar to a *Hawker Harrier* jump jet), and used this as the basis for the design decisions that formed the architecture and aesthetics of the final design (Peary, 1984). In the process of designing the vehicle, Mead produced illustrations of his designs that not only showed his ideas for the spinner, but also showed what he felt would be going on in the background, not in the sense of what was happening in the story but what was in the subtexts of the narrative. Scott, himself a designer and sketcher, was intrigued by the backgrounds in Mead's illustrations, and Mead was commissioned to design further products, vehicles, and architecture (Sammon, 1996). Scott and Mead, together with Production Designer Lawrence Paull and Associate Producer Ivor Powell, developed the concept of "retrofitting" that characterised the production design – the idea that old

things would not be thrown away but would be upgraded with layers of new technology (Sammon, 1996. p.79). Mead explains the origin of the layering approach:

Because in 2019 there was so much energy being devoted to off-world activity, for which the replicants were made, the consumer base wasn't getting much attention. This meant that the population was very actively collecting bits and pieces of add-on layers to make their original articles work. Today, in many third-world countries you'll find older vehicles, some dating back to the Thirties and Forties, that have air conditioners on top, larger batteries and generators, mud-flaps and hang-on fixtures. They're retrofitted machine constructions that bear superficial resemblances to the original articles, but they've been overlaid with so many add-ons that they've taken on a style of their own. We labelled that style, which influenced the look of the film, 'retro-deco'. (Mead, in Peary (1984. p. 202))

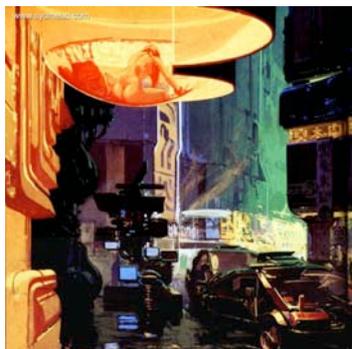


Figure 6.3
Syd Mead's ability to create contexts is evident in this conceptual drawing for Scott's *Blade Runner* (1982).
Cultura e spettacolo,
<http://www.culturaspettacolovenezia.it/immagini/blade4.jpg> BR cityscape

This layering came to represent the whole 'feel' of the production design, and was also applied to products, vehicles, and architecture. The processes through which these ideas were developed are explained in a number of publications in interviews with Mead and Ridley Scott, but most notably in Paul Sammons book *Future noir: the making of Blade Runner* (1996). What is evident in all these sources is that (as noted previously) this level of resolution engages both with the narrative itself and with its subtexts.

Mead's ability to generate contexts within which his designs exist appears to be so deeply ingrained in his design processes it is almost intuitive. Mead considers that his ability to render ideas on paper at a young age has allowed him to spend time developing the manipulative skills to render not only the details of his designs but also design his backgrounds.

I started to draw early on. I still have drawings of cars with drivers and passengers that I did when I was three years old. I've always

thought about objects in the context of their actual use. (Mead, in Mortensen, S. http://www.indexmagazine.com/interviews/syd_mead.shtml)

The processes that he follows are made clear in his publications and also in many of his interviews. Mead appears to work through the narrative and extrapolates ideas about possible technologies that are then used to base design decisions on. These stories go into far more detail than the narrative requires, but by his own account, Mead sees that this world-building process gives him direction in which to develop the design. For example, these are some of his thoughts about one of the vehicle designs for the main character in *Blade Runner*:

Deckard's sedan was a decommissioned luxury 'flying' limo. Hey, if cars could fly it was a mature technology. What do you do with a decommissioned flying limo? Why, you take off the aerodynamic exterior panels, add big bumpers, a traffic lighting package, plaster your paranoid anti-theft stuff all over it, and you end up with this truncated, really weird looking street vehicle. (Mead in Kissell, n.d. <http://media.bladezone.com/contents/fim/interviews/syd-mead/interview.html>)

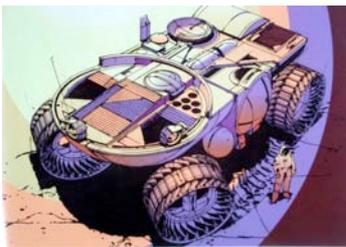


Figure 6.4
Mead's proposal for a Mars rover for *Mission to Mars* (dir. De Palma, 2000) was developed around an understanding of the environmental context on the planet.
Mead 2001. p.107

This level of understanding, of "honouring" the context (to use John Seeley Brown's term, cited in Section 3.7.2) is critical to the quality and feel of Mead's work. Mead sees the importance of context this way:

You use pictorial logic. Everything looks a certain way because of the history of its use. The key to designing a technical object is to imagine the optimum solution to the problem without any restrictions on manufacturing techniques or materials. But, to do that, you have to know how things are made. Even if it's a fantasy, there must be a logic to why it looks the way it does. Otherwise, you'll create things that will have no particular impact on the viewer. People are more visually sophisticated than you might think. (Mead, in Mortensen, S. http://www.indexmagazine.com/interviews/syd_mead.shtml)

The impact of Mead's understanding of context is evident in most of his comments about design processes.

6.3.2 Syd Mead on Syd Mead, Industrial Design and Science Fiction

Syd Mead has been interviewed extensively, and there is much material about him and his design processes available in print and through the Internet. As Mead exemplifies many of the issues in this study, he was approached through his publishing company *Oblagon* and asked if he could contribute. He agreed to respond to a series of short questions by email on the understanding that he was not asked anything that could be learnt any other way.

This was an exceptional opportunity to test some of the ideas in this study.

Mead was asked about three areas:

- Syd Mead and science fiction;
- Syd Mead as a visual futurist;
- Industrial design and science fiction.

Mead provided responses to all the questions. The questions and the text of his reply on 19.12.05 are included in the Appendices. All quotes here are verbatim.

In addition, Syd Mead offered a general comment about the topic.

6.3.2.1 *Syd Mead and science fiction*

There was one major surprise in Mead's responses. Mead was asked if his interest in science fiction had affected the way that he thinks as an industrial designer. It was expected that Mead might respond that his interest in science fiction enabled him to better imagine scenarios for his products, or that it stimulated his imagination. Mead responded "*in short, no.*"

Mead explained the basis for this response:

I don't really think of what I do as a specific idea destination. What I 'think' about is that whatever world format becomes the basis of the 'fiction', (the science in 'science fiction' can be predictive...ie, technical expertise catches up with the theoretical idea) that world needs all the stuff that the present has to create scenario. I appreciate the pretence of what 'that world's' technical proposal happens to be and then design to match the logic of the pretence. My process in creating imagery and 'design' for a science fiction conceit is exactly the same as for 'real' industrial design.

To Syd Mead, there is no difference in designing for science fiction or design for the real world: his processes are the same, and he is trying to understand the same things. At this level, Mead is suggesting that there is no dividing line between industrial design and science fiction – not even a grey area.

6.3.2.2 Syd Mead as a visual futurist

Mead was asked what feedback he had received from designers about his first book *Sentinel*, and what he himself felt about the influence of the book. Mead responded by briefly describing how the book came about, and observed:

I get a lot of comments now from guys whose FATHERS got the books, showed it to their sons and then... I feel enormously proud and humble at once. My fan base now extends down to the second generation of the first readers of those books!

Clearly Mead's work is not perceived by this audience as being dated or irrelevant, even though the explicit design ideas in *Sentinel* are identifiably 1970s in feel.

Mead was asked what feedback he had received from designers about his most recent book *Syd Mead's Sentury*, and if the feedback had been any different from *Sentinel*. Mead's response was:

I can't really say... Sentury has been in circulation for four years, but I will tell you that whenever Roger¹ and I have a presentation and the book is on sale, we sell out. All of the movie studios have them on their reference shelves, as well as university and college libraries.

While this was not as clear an answer as might have been provided, Mead has identified another instance of cause-and-effect in the industrial design / science fiction relationship.

6.3.2.3 *Industrial design and science fiction*

Mead's general response to the topic included this observation:

The link between 'science fiction' and 'industrial design' demands that those two areas are sufficiently defined so as to allow comparison in the first place. Yes, both employ artifact [sic] as illustration of story.

It is useful that this study has spent some time defining industrial design and science fiction so they can be compared.

The remainder of Mead's responses on this issue are included in Section 6.5.5, where they relate to the case study that looks specifically at industrial designers and science fiction cinema.

6.4 *Bruce Sterling*

6.4.1 Overview

Bruce Sterling is another person who represents most of the ideas at the core of this study. While Syd Mead has had an impact on science fiction based on his background as an industrial designer, Sterling hopes to do the opposite –

¹ Roger Servick is Syd Mead's business partner.

have an impact on industrial design based on his background in science fiction.

In Section 4.5, Sterling was noted as one of the major exponents of science fiction's cyberpunk movement in the 1980s (Butler, 2000). His novels include *Island in the Net* (1988) and *Distraction* (1998), and he has won two Hugo Awards for his short fiction. He has published three works of non-fiction focussing on information technologies, design and culture, the most recent being *Shaping Things* (2005) – a book that melds futurism, industrial design and elements of science fiction.

In terms of this study, Sterling has two strings to his bow. One is his founding of the Viridian Design movement; Viridian is a shade of green, an unobvious hint that the central interests of Viridian are sustainability and greenhouse gas emissions in particular. The second string is his term as 'Visionary in Residence' at the Art Center College of Design in Pasadena, California.

Clute and Nicholls describe Sterling's main interests as a science fiction author as *"the behaviour of societies rather than individuals, and the perfection of sf as a vehicle for scientific education and political debate"* (Clute & Nicholls, 1999. p.1164). This interest in societies and political debate has found another avenue of expression in his work with Viridian and Art Center. Echoing the themes that design historian Penny Sparke has explored, Sterling says of himself *"What I'm really interested in is the intimate interplay of technology and culture."* (Sterling, 1998. www.strangeworlds.com/archive/viridian.html)

Much of the information about Bruce Sterling comes from the Internet. Sterling is very comfortable with contemporary communication technologies, and his thematic interests are expressed through his regular use of Internet blogs (he is one of the mainstays of the www.wiredblogs.tripod.com blog website) and through the Viridian Design website (www.viridiandesign.org).

Sterling's non-fiction writings since the turn of the millennium indicate a strong sympathy with the ideas of industrial design.

I call myself a science fiction writer because that's the name of my genre, but when I'm trying to pin a scene down on a page, I'm really writing "design fiction." I spend a lot of time thinking about imaginary products, cyber products, and post-industrial products. Design thinking has become a powerful means to my end...

In doing so, I've found that a designer's approach is fruitful. It is more productive, more authentic, more convincing and more moving than the wide-eyed approach of a sci-fi visionary, a new age guru, a pop-science Mr. Wizard figure, or even a dot-com stock promoter. Why? Because designers possess some kind of empirical reference, their ideas are linked to physical reality. (Sterling, 2005a. www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006)

Sterling is suggesting a complementary relationship between industrial design and science fiction, with industrial design contributing through making ideas into reality. When asked about product design during an interview on the *Science Fiction Weekly* website, Sterling responded:

I'm spending a lot of time with product design people now. I consider industrial design people to be sort of the 'uncrowned kings' at the moment. These are the people who are actually stepping into the power vacuum that's been left by the collapse of politics and the military... People aren't looking at them but actually the industrial designers are closer to pop stardom than they have been in a long time. It used to be back in the '30s, you could be someone like Norman Bel Gettys [sic] and you were really some kind of a rock star figure. (Sterling, in Barry, 2001. www.scifi.com/sfw/issue203/interview.html.)

Sterling values the pragmatic approach that he sees in industrial design.

Now, I'm not claiming that designers really are supreme visionary geniuses. In fact, even though they have a rep for being kind of

flaky, arty, and temperamental, since I myself am a science fiction writer, I can see that designers are actually cram-full of stony common sense. I actually trust designers. I think designers are the salt of the earth. I have a better opinion of designers than designers have of themselves. (Sterling, 2001. www.viridiandesign.org/notes/226-250/00241_furniture_fair.html)

Clearly, Sterling himself is excited by the idea of rubbing shoulders with industrial designers. Sterling was invited to contribute to this study, but declined on the basis that he was too busy – possibly a verification that there is more than enough work involved in this area. He did respond by email that the topic was “*mighty interesting*” (Sterling, personal communication, 2006) (this email is appended).

For a combination of reasons – his status as a founder of cyberpunk, as the founder of Viridian, and as a visionary who is highly enthusiastic about industrial design - Sterling is a key figure in this study.

6.4.2 Viridian

Sterling’s Viridian movement simply and explicitly brings science fiction’s mode of interrogation to an industrial design setting. While Viridian is focussed on the problem of greenhouse gases, many of Sterling’s ideas are applicable across a range of sustainability issues.

Our society runs on fossil fuel. We have a substance-abuse problem with carbon dioxide. This is a seemingly abstract issue now, but it’s going to get very, very much livelier once we start having evacuation camps and dustbowl. And at that point, anyone who isn’t talking about the Greenhouse Effect is going to seem very twentieth century and extremely old-fashioned. (Sterling, in Godwin, 2004. www.reason.com/0401/fe.mg.cybergreen.shtml)

Sterling sees a link between responsibility and design, and believes that design as a profession can have a genuine impact in the area of environmental impact.

What I want to see from the design community – let's be frank here, what I demand – is an intensely creative, and intensely aware, and focussed twenty-first century design movement. A new movement that knows what time it is, understands the great stakes at risk, and completely obliterates the crap techniques, crap approaches, crap methods, crap industries and crap consumer goods of the twentieth century. (Sterling, 1999a. <http://www.viridiandesign.org/idsa.html>)

Sterling describes himself as the “*absolute monarch*” of Viridian (Sterling, 1998a. www.strangewords.com/archive/viridian.html). The primary communication tool for Viridian is its website, which Sterling describes as an “*electro version of a design magazine. I use it as a kind of social probe. It's an experiment for me, a way to give and get back at the same time.*” (ibid).

His interest in the issues of responsibility and sustainability are somewhat more pragmatic than might be expected from someone with an explicit and provocative interest in the future of the environment. Sterling distances himself slightly from the traditional Green environmental movement – who he describes as “*undifferentiated primal newage*” - by stating he has no interest in anything mystical or spiritual (ibid).

So what do the Viridians do?

We folks in the Viridian Green movement don't design any actual products. We don't have the capacity, the talent or the hardware. Mostly, we imagine cool, green, futuristic sci-fi products that we would like to possess. (Sterling, 2000. <http://www.highgrounddesign.com/design/dcessay996.htm>)

The Viridian Design website shows a variety of approaches to the issue of climate change attributed to the Greenhouse Effect. The website:

- charts contemporary events that exemplify the changes occurring in society as a result of climate change;
- maintains a catalogue of Viridian-related writings and blog entries;
- runs a small number of design contests: for example, 'Embrace the Decay';
- maintains a list of recommended products, including books, furniture, and links to examples of products and processes that meet Viridian's standards.



Figure 6.5
Humanscale Freedom chair
designed by Neils Diffrient (but
looks like *2001: A Space Odyssey*).
Everything for Offices
<http://www.everythingforoffices.com/images/new%20humanscale%20Freedom%20.jpg>

Possibly the most relevant part of the website is the "Viridian Principles 1.0" (Sterling, 2005c. www.viridiandesign.org/principles.html). This is a list of broad principles that expand on the intent of the movement. These principles are articulate, may be seen as slightly irreverent, and show some knowledge of the ideas of sustainability and industrial design. For example, this is one of the five 'Futurist Principles':

Planned Evanescence

"Planned Obsolescence" means that a product will be driven off the market, in a known time-frame, by some purported improvement.

The Viridian principle of "Planned Evanescence" extends this practice by demanding that the product and all its physical traces should gracefully disintegrate and vanish entirely.



Figure 6.6
Herman Miller's Aeron chair, designed
by Bill Stumpf and Don Chadwick (but
looks like *Brazil*). *The magazine.info*
<http://www.themagazine.info/56/Pictures/Herman%20Miller/AeronchairTwo.jpg>

The following recommendation from the 'Universal and Ergonomic Design' category in 'Recommended Products' is interesting for two reasons: it recognises the work of Niels Diffrient (who was the heir to Henry Dreyfuss's design business) (Flincham, 1997), and uses science fiction movies as a means of communicating the 'feeling' of the design.

*Humanscale: Niels Diffrient's Freedom chair is perhaps the next ergonomic step after Aeron. It looks less like it came from the set of *Brazil* and more like *2001*. And it's supposed to be simpler to adjust. We couldn't find out anything about its greenness, though.*

(Bergman, 2005. www.viridiandesign.org/products/furniture.htm)

It is difficult to assess the impact of the Viridian Design movement. It regularly receives exposure in online design-related forum www.core77.com but not on the similar but more skill-focussed website Product Design Forums (www.productdesignforums.com) for example. It may be that the success or otherwise of Sterling's initiative can only be assessed in hindsight.

6.5.3 Visionary in Residence

As noted in Section 6.5.1, Sterling spent some of 2005 at Art Center College of Design as Visionary in Residence. Sterling described his role in the College as "*Basically, I've become a designer futurist. I help to teach a class that's working on a Danish-sponsored design show in Copenhagen that's visualizing the year 2010. Doing this is even weirder than it sounds.*" (Sterling, 2005b. www.austinchronicle.com/issues.dispatch/2005-03-04/screens_feature.html)

An Art Centre press release describes Sterling as being "*particularly interested in 3D, product design, and CAD-CAM systems and their impact of society and the economy over the next few decades.*" (Art Center College of Design marks its 75th year, 2005. <http://www.artcentre.edu/mdp/main.html>)

Sterling brings some interesting ideas into the industrial design field. He has proposed the term 'spimes' as the next big thing in design. The concept refers more to a set of ideas rather than an actual physical product. Spimes are products that exist within an interactive communications environment – they manage information (both transmitted and received), act as an interface through which objects can be constructed (through a 3D printer, for example), and leave no footprint on the environment at the end of their lives. These ideas have been developed through his term at Art Center. (*Bruce Sterling's design future manifesto: viva spime*, 2005. www.boingboing.net/2005/10/26/bruce_sterlings_desi.html)

In an article titled '*What's a science fiction writer doing hanging out with designers anyway?*' published in Innovation Online (the newsletter of the Industrial Designers Society of America), Sterling asks the questions "*Why do*

I – a science fiction writer – spend more and more time with designers? What does science fiction have in common with industrial design? As it turns out, quite a lot.” In this instance Sterling fails to directly answer the questions, leaving his opinion of the topic to be read between the lines. (Sterling, 2005a. www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006)

Sterling says that he gets something out of being associated with industrial designers. By his account, he does not see himself just carrying an evangelical message of sustainability to the design profession, but values industrial design ideas and processes. It is likely that some of this sympathy comes from a mutual interest in technology. Sterling clearly enjoys how industrial designers think:

... I'm especially fond of designers. Designers, especially industrial designers, are one of the few classes in society that talk as strangely and anomalously as good science fiction writers do. The range of thought and expression you can get out of designers, the sheer expansiveness of their professional rhetoric, is absolutely enthralling to me. (Sterling, 1998a. www.strangewords.com/archive/viridian.html)

After the completion of his residency, Sterling wrote an article for *Metropolis* magazine reflecting on his time at Art Center. One of the themes in his reflections is action: the bridging between idea and application.

Practice is the crucial difference between people who can talk (like myself) and people who can design (like my best students)... At design school I escaped a mental box. In my earlier self-definition I was a writer with speculative tendencies; I never created big goofy art installations. It turns out I can do that. It's possible. I just never knuckled down and tried it.

Design, as Charles Eames said, is a method of action. It's not a method of "vision." A designer, as Henry Dreyfuss said, is an artist

who leaves the ivory tower and takes the elevator down to the ground floor. I'm still no designer, but I do like the action.

(Sterling, 2006. http://www.artcenter.edu/accd/news/news_art.jsp?id=4633)

This is why Sterling is “*hanging out*” with designers: he sees the pragmatic, realistic side of industrial design as an opportunity to change the way that industry thinks about the implications of contemporary behaviours.

6.4.4 Norman Bel Geddes

Sterling has repeatedly referred to Norman Bel Geddes in his recent writings, and has described Bel Geddes as a “*rock star figure*” (Sterling, in Barry, 2001. www.scifi.com/sfw/issue203/interview.html). He describes Bel Geddes’ work as displaying the sense of wonder that Sterling describes as a “*signature product*” of science fiction (Sterling, 2005a. www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006)

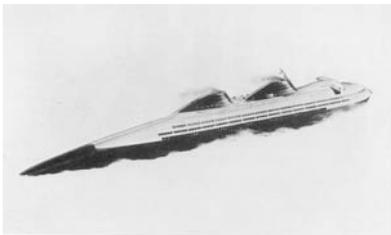


Figure 6.7
Norman Bel Geddes’ speculative
ocean liner design.
Politecnico di Torino
<http://www2.polito.it/strutture/cisdal/HypArc/resolution/oliner1.jpg>

You see some of this sense-of-wonder business also in the industrial design profession. If you want to see some truly classic American industrial design sense of wonder activity, you have to look back to misty, mythshrouded [sic] industrial designers such as Norman Bel Geddes. Bel Geddes designed a number of practical, commercial products for the industrial design mass-market – stoves, cocktail shakers, radios – but he always seemed more at ease coming up with wild, wondrous, off the wall schemes such as a ritzy hotel built inside a giant concrete dam or huge, amphibious, transatlantic flying wings with enough room inside for a squash court. And who can forget the Futurama General Motors Democracity² that he designed for the 1939 World’s Fair? (Sterling, 2005a. www.wiredblogs.tripod.com/sterling/index.blog?entry_id=638006)

² Sterling is conflating the names of Bel Geddes and Dreyfuss’s World Trade Fair projects.

Sterling is more specific about industrial design when he is discussing Bel Geddes work:

Man, that was moxie, that was the holy grail, that is the stuff we need. We need a lot more of that stuff, boyo. Somewhere out there in today's designerland is a guy who can really do that. I want to know about that guy. I want the world to shower that guy with riches, fame, and power. I want to talk to that guy, I want him to meet all my friends. I want to buy that guy's products. I want him to get traction, horsepower, juice of every kind, and major command-and-control. I want to see him as a superstar. (Sterling, 2001. www.viridiandesign.org/notes/226-250/00241_furniture_fair.html)

Even more valuable as far as this study is concerned, is that Sterling has also identified Henry Dreyfuss' comment about the blank wall in Bel Geddes office as representing ideas that exemplify what industrial design is trying to do (see Section 1.4). (Emphasis by Sterling).

It's like Henry Dreyfuss used to say about Norman Bel Geddes. He said that Bel Geddes always had his desk facing a blank wall. Now, Norman Bel Geddes was a top-end Broadway set designer, he knew what a window treatment looked like. Norman Bel Geddes could have had any kind of office he wanted, so what's with the blank wall? Because that's where Bel Geddes got his really big ideas, that's why.

I have to go along with Henry Dreyfuss in considering that an act of raw courage. (Sterling, 2001. www.viridiandesign.org/notes/226-250/00241_furniture_fair.html, retrieved 16.5.06)

This theme is tied together by a quote from Sterling's Viridian Design website, which expands on the 'blank wall' metaphor:

If you choose, you can step outside the boundaries that history makes for you. You can walk through walls. (Sterling, 2005c. <http://www.viridiandesign.org/principles.html>)

Sterling provides a different perspective on the relationship between industrial design and science fiction. Sterling appears to feel that the two areas are dealing with similar ideas and interests, but that the pragmatic, applied nature of industrial design complements the questioning, visionary nature of science fiction.

6.5 *Industrial Design and Science Fiction Cinema*

6.5.1 Overview

There should be a total integration on a film, a complete synthesis running through the hands of a director who is interested in everything. That includes all the design elements. Certainly there are moments in movies where the background can be as important as the foregrounded actor, whether that background be a figure or a landscape. (Ridley Scott, in Sammon (1996. p. 73))

It's got a lot of blinking lights, and as we all know, blinking lights mean 'science'. (Whedon and Mendle, 2005) (Joss Whedon, referring to the design of the control deck of the spaceship 'Serenity').

Ridley Scott – a director who has contributed two movies to the science fiction cinema canon - clearly believes that production design is a critical component of a film. This is evident not only in his comment quoted above, but also in his movies *Alien*, *Blade Runner*, and the mainstream epics *Gladiator* (2000) and *Kingdom of Heaven* (2005).

The (partly) tongue-in-cheek comment from director / writer Joss Whedon (producer / director / writer of the *Firefly* TV series (Whedon, 2002) and the

spin-off 2005 movie *Serenity*) shows the other end of the spectrum, where a generic approach to the design of the set of *Serenity* leaves the actors to develop the way that they interact with the controls of the spacecraft. This is in marked contrast to Scott's approach to design in *Alien* and *Blade Runner*, and is an important difference between Scott's movies and many other science fiction productions that have treated their production design lightly.

This study contends that the relationship between science fiction cinema and industrial design is strong, even if it has not previously been explored at any depth. In Chapters 4 and 5, science fiction cinema was identified as one of the core areas of science fiction, and as the most visible of the science fiction media. The design content of a science fiction movie is often an integral part of both the narrative and the movie's visual character. When the visibility of science fiction cinema is considered, this study suggests that the success of a movie's industrial design content can have an impact not only on the movie itself but also more broadly on the perception and role of industrial design. Even if the production design seems to be only a background to the story, as graphic novel author Dean Motter observes:

...as any good classical painter might tell you, the background is much more powerful than the foreground, precisely because it is subliminal. (in Haber (2003. p.145))



Figure 6.8
Product placement: *Black and Decker's* rehydrator features in *Back to the Future: Part 2* (Image capture, dir. Zemekis, 1989)

This study notes that the importance of the 'hardware' in a movie is underlined by the presence of product placements in Hollywood movies. The positive marketing effect of exposure in these movies is recognised by companies such as *Black and Decker*, *Hitachi*, *Sony*, *JVC*, and *Audi*. The issue is not limited to science fiction movies, but the implicit link that can be made between existing manufacturers and the future in science fiction is obviously something that manufacturers feel is of real benefit. The *Back to the Future* series (dir. Zemekis, 1985) is notable for its many product placements, but the trend is apparent in many contemporary science fiction movies. *Red Planet* (dir. Hoffman, 2000), *Mission to Mars* (dir. De Palma, 2000), *Minority Report* (dir. Spielberg, 2002), and *I, Robot* (dir. Proyas, 2004)

are all clear examples of the impact of product placement, showing varying degrees of subtlety in their inclusion of commercial products and brands.

The impact of iconic designs for science fiction cinema is recognised in this extract from an article by *I.D. Magazine* about the design of a robot for the movie *Red Planet*:

Designing a compelling robot for the screen is, at its very minimum, an unenviable task. Consider the formidable history: Robotrix of Metropolis, Forbidden Planet's Robby the Robot, the stainless steel terror of Terminator 2; hell, even the slap-happy sentries in Star Wars. They're pop colossi, things that linger in the dreams of our children and creep deep into the core of our culture. (Fierman, 2000. p. 74)

All these issues underline the value of science fiction cinema to the design profession – and the value of the design profession to science fiction cinema. Not only does the *visibility* of the design content make science fiction cinema important to industrial design, but the *process* of designing for possible futures is useful to the commercial practice of industrial design at several points as well as connecting with design education. Science fiction cinema is demonstrably a genre that excites industrial designers.

This study notes that good design for science fiction cinema is far broader than the ideas of 'good design' discussed in Section 3.3.4. While individual objects within a movie might be assessed as successful by conventional design-related criteria, the reality of most production design for science fiction movies must include *every* aspect of the future. This is likely to include well-designed and poorly-designed objects, kitsch, vernacular design, discarded and abused products, and so on. The only science fiction movies that might exhibit a uniform sense of good design are those set in a completely artificial environment such as a spacecraft.

In addition, not all science fiction movies have strong connections to industrial design: the exploration of the social themes apparent in much

science fiction (or an emphasis on entertainment) does not always demand the design of new objects, spaces and environments for movies. In the low-key science fiction movie *K-Pax* (dir. Softley, 2001), which is set on the Earth of the here and now, the impact of the science fiction ideas rely on the sheer familiarity of the surroundings, and contain no new design ideas whatsoever. At the other extreme are movies such as *The Fifth Element* where design is a rich, vital and essential part of the movie's visual character.

This study proposes six themes that can be used to analyse and critique the design content of science fiction movies. These ideas are original to this study, and have been constructed around the relationship between industrial design and science fiction that has been described through this thesis.

- *Chronology*: the history of the future of industrial design;
- *Intent*: how design is used as a tool to support the narrative of a movie;
- *Framework*: the context of technological, social and cultural issues and ideas that shape the design of systems and products for a movie;
- *Leakage*: the use of design elements that are intended to represent the future in the movie but actually represent design concurrent with the period of time in which movie is produced;
- *Design classics*: the use of design classics to divorce the design content from any particular time period;
- *Special effects*: the impact that special effects technologies have on the design elements of a movie.

These themes could also be used to construct or direct production design processes, although discussion and validation of this possibility is outside the scope of this study.

6.5.2 Industrial Design Themes in Science Fiction Cinema

6.5.2.1 Chronology

Investigating science fiction cinema is like stepping into a themed museum. What is on display is the history of the future: a history of what moviemakers thought could or shouldn't happen. This is similar to the themes evident in



Figure 6.9
Forbidden Planet (dir Wilcox, 1956)
 contains a lot of 1950's leading edge
 design. *Redemption Blues*,
<http://www.redemptionblues.com/pictures/fpcolour.jpg>

Corn and Harrigon's *Yesterday's Tomorrows* (1984) and Brosterman's *Out of Time* (2000).

Landon has described many science fiction movies as time travel (a staple of science fiction literature and cinema) but not in the narrative sense; his contention is that we can look at the past through the study of these productions (Landon, 1992). Kuhn terms this 'reflection' in the context of cultural issues that are unconsciously represented in cinema (Kuhn, 1990). In a design sense, the way that the future of design is portrayed is also time travel, and in hindsight the analysis of what was thought futuristic at the time of these productions has lessons for how we understand the future of design now. Landon has noted this with reference to broader issues of narrative and theme, but his comments apply equally to the representation of design content:

The imaginary elsewhere and/or other time of the SF film must be constructed from materials, technology, and imagination inevitably limited by what is possible here and now, and the evidence of film after film suggests that one of the most difficult tasks is to free SF worlds from prevailing cultural patterns and assumptions, futuristic cities, say, being much easier to imagine than futuristic family structure or sex roles. (Landon, 1992. p. 24)

While Landon might be correct in saying that architecture is easier to imagine than sociology, much science fiction cinema still displays an inability to invent realistic or cohesive design futures. In his comments, Landon has defined one of the challenges that science fiction cinema presents to the design profession – to design futures that are really futures rather than laying a veneer of naïve futurism over the present.

6.5.2.2 Framework

In Section 4.7.2, the concept of world-building within a science fiction context was discussed, including two examples of world-building for science fiction cinema (*The Fifth Element* and *Minority Report*).

Analysis of the texts show that to create appropriate futures for science fiction movies, not only do technological advances or inventions need to be conceptualised, they need to be given flesh and form in the same way that any industrial design project progresses from concept to reality. In a conventional commercial project, designers will be working with a set of criteria that might include issues of use and function, cost, technical and manufacturing constraints, plus broader factors of history, environmental responsibility and social acceptability. However, when designing for the fictional world of a science fiction movie, many of these design criteria are missing. One approach that designers can employ is to interpolate these criteria from the fictitious world that the movie creates: to establish what this study terms the *framework* of a society that might exist in this world.

The framework is the set of technological, social, biological and historical ideas that are created to support the narrative. Every movie, science fiction or not, has its own framework: however, in any production set in the real world the framework already exists and is well understood by the audience. Ideas that do not require explanation in a movie set in our existing framework would include remote controls for electronic products, cellphones, cars, and firearms. These are not nova, they are everyday objects that the audience are familiar with.

However, in science fiction cinema with its high levels of subjunctivity, all or part of the framework will be fictional and will require articulation by the narrative. Not only do products have to be designed that will fit into the fictional future world, the technologies that these products employ may have to be invented as well. In many productions, these differences between the real world and the fictional one are crucial to the narrative.

In principle, science fiction futures that are Earth-based have a narrower set of design challenges in that many design paradigms are already set. By contrast, futures such as the *Star Wars* series are set in entirely alien universes. In theory, at least, the design content could be built on a set of understandings that are equally alien. Some of these are ideas made familiar by previous exposure to science fiction; others are innovative and require

placing within the world of the movie. In the *Star Wars* universe, the original movies introduced ideas such as the mystical 'Force' and the Jedi Knights who employ it, an Empire that has declined from a position of control over a huge range of star systems, and the almost universal use of the English language between alien races. Technological elements that exist *within* this framework include anti-gravity, practical faster-than-light travel between star systems, and force field manipulation that allows the development of lightsabres (a beam of energy that stops at a defined distance from its source), and tractor beams (an energy beam that can pull something towards it). Once the ideas are established, other design elements can be developed around these technologies.

Framework is a concept that connects with key concerns of industrial design. In order to design products that are of genuine use to users and society, contemporary industrial design practice must recognise and honour contexts of use. Framework as a concept is the creation of meaningful and useful contexts: a skill that is very similar to that recognised by John Seeley Brown (in Section 3.4.2). These frameworks are then articulated through a narrative, which almost exactly matches Peter Schwartz's scenario methods (also in Section 3.4.2).

The design elements in science fiction cinema often stay within easily recognisable boundaries for a variety of reasons. One of the pragmatic reasons for the familiar nature of much of the design content is the need to create worlds that are alien on one hand but easily recognisable for the audience on the other.



Figure 6.10
 Framework: *The Fifth Element* (dir. Besson, 1995) contains a dense production design content with a strong sense of framework. (Image capture, dir. Besson, 1995)

This issue is discussed by Dan Weill, production designer for *The Fifth Element*:

Without dictating a design style, I wanted to make the design colloquial and ensure that it didn't entirely lose touch with reality; if you feature a flying car, the audience wants to understand how it works... We sought to avoid making every aspect of the design

hyper-modern; we kept the basic body of the New York cab for example. (Weil, in Etedgui, (1999. p. 186))

This is also an instance of Raymond Lowey's MAYA (Most Advanced Yet Acceptable) principle identified in Section 3.5.

In some movies, the production team may not consider framework to be a critical production design element. For instance, in *Metropolis*, design appears to be used more for its ambience rather than its specifics. However, as both Ridley Scott and Motter note (at the beginning of this section), at times the background in a film is as important as the foreground, and it is possible that neglecting the production design content in this way interferes with the suspension of disbelief that is a useful element of any work of fiction.

Syd Mead notes that *Blade Runner's* sense of framework is a major reason that the design vision has remained influential (although he does not use that term). "*Blade Runner has a level of detail consistency that I was fortunate enough to visualize. The movie never violates its basic rationale, either technologically or in terms of scenario continuity.*" (Mead, personal communication, 2005). Mead expands on what he sees as problems that arise when the framework for a movie is ignored:

The largest single flaw, for me, in cheesy 'sci-fi' is the unlinking of story and believable artifact [sic]. If the cars can fly, why does the 'hero's' car NOT fly when a crisis arrives? To selectively violate a story premise for the convenience of the plot is, to me, the biggest block in movie formats. (Mead, personal communication, 2005)

6.5.2.3 Intent

This study sets out the argument that the production design content of a specific film is essentially a tool wielded by the production team to support the intent of the movie. What is visible on the screen is as much about design itself as it is about the preoccupations of science fiction. Speculations about the future in science fiction films are not only about the future of society, they also inevitably reflect the future of design and its place in the world. The roles

of science fiction (prediction and interrogation) also apply to the design content of science fiction cinema.

The thematic analysis of science fiction cinema is a typical approach to the analysis of the genre (Baxter, 1969; Brosnan, 1978). This is also a useful approach for this study.

This study has identified three broad themes or categories of design futures, each with three sub-themes. These categorisations reflect partly the intent of the narrative, but specifically relate to the design content, the sense of framework, and how the production design is used. The intent of the movie has a significant effect on the nature of the framework and the design elements that fit within that framework.

These intents and issues are mapped out in Table 3, along with key examples that demonstrate how these intents are applied, and their effect on the movie.

Table 3
Design intent by theme

Design Intent	Theme	Key Examples
Predictive	Near future	<i>2001: A Space Odyssey, 2010, Blade Runner, Gattaca, I, Robot, Minority Report, Short Circuit, Strange Days, Things To Come, Time Cop</i>
	Far future	<i>Alien, Forbidden Planet, Planet of the Apes, Serenity, Starship Troopers, Star Trek etc</i>
	Post-Armageddon	<i>Mad Max 2/3, The Matrix, The Omega Man, The Postman, Waterworld</i>
Commentative	Satirical	<i>Back to the Future 2, Barbarella, Demolition Man, Robocop, The Fifth Element</i>
	Allegorical	<i>12 Monkeys, 1984, A Clockwork Orange, Brazil, Metropolis, The Matrix, THX1138</i>
Fantastic	Earth-based	<i>12 Monkeys, Event Horizon, Fantastic Voyage, Lost in Space, Running Man, Terminator, The Fifth Element, Tron</i>
	Alien Technologies	<i>Alien sequence, Forbidden Planet, Independence Day, Men in Black, Star Trek etc, The Day the Earth Stood Still, This Island Earth</i>
	Anywhere-else based	<i>Star Wars sequence, Battle Beyond the Stars, Dune</i>



Figure 6.11
I Robot's predictive design content includes an Audi that uses spherical wheels
 (Image capture, dir. Proyas, 2004)



Figure 6.12
 The production design of post-Armageddon movies such as *The Matrix* (dir. Wachowski & Wachowski, 1999) is usually assembled from the detritus of today.
 (Image capture, dir. Wachowski & Wachowski, 1999)



Figure 6.13
 Gilliam's *12 Monkeys* (1995) uses its allegorical production design to dislocate and challenge the viewer.
 (Image capture, dir. Gilliam, 1995)

The design intents and themes are defined as:

Predictive: A deliberate attempt to create a possible future with realistic assumptions about technological advances.

- *Near futures:* A substantial connection between the design content of the movie and contemporary design, or where the design content of the movie attempts to realistically portray foreseeable advances in design and technology.
- *Far futures:* A substantial disconnection between the time frame of the movie and the design content of the now but with no 'fantastic' content.
- *Post-Armageddon:* Where the production design content is assembled from the detritus remaining after a planet-wide nuclear or ecological disaster.

Commentative: Where the design content is used to reinforce an intentional satirical or allegorical theme in the movie.

- *Satirical:* design content is used humorously in a way that attempts to cast a new light on objects that the audience are familiar with. This often happens in a narrative set some time in the future where contemporary items are lampooned for their quaintness.
- *Allegorical:* the production design is used to support the subtext of the movie as well as the story. For example, the visually chaotic and claustrophobic production design for Terry Gilliam's *12 Monkeys* (1995), while having little connection to any sense of prediction, creates a strong sense of disconnection and dislocation.

Fantastic: The use of technologies that are currently believed to be impossible as against highly improbable e.g. time travel, matter transference, the Force (from *Star Wars*) and so on as a major element. Anti-gravity is a common theme that places movies in this category.

- *Earth-based:* Where the design content is connected with Earth in some way and there may be some familiar elements.
- *Everywhere-else based:* Where societies and technologies are developed from scratch (or should be). These movies could, in theory, explore a far wider range of design possibilities than most other movies.



Figure 6.14
 HR Giger's Alien: a genuine attempt to create an alien lifeform and its technologies. (Image capture Aliens, dir. Cameron, 1986)

- *Alien Technologies*: where the aliens and their technologies provide some of the design content.

There are some strong areas of crossover in these categories. For instance, 'Predictive / Far Future' could just as easily be 'Fantastic / Earth-based' under the principle of 'Arthur C Clarke's Third Law' ('*Any sufficiently advanced technology is indistinguishable from magic*', also noted in Section 3.8.2).

Some of these movies will also appear in two columns – for example, *Alien* has material that can be categorised as 'Alien Technologies' and other design content considered 'Predictive / Far Future'.

The interaction between the plot and the framework is an issue that must be considered. In *Blade Runner* the director dictated the density of the background material, but in a sense the density of the design content in *Blade Runner* is of peripheral interest to the main narrative themes. The important technological advance in *Blade Runner* is the ability to manufacture artificial people with specific abilities, with the peripheral issue of space travel: neither of these has any direct bearing on the design of the movie. However, the dense visual 'feel' of the movie perfectly supports the intense and questioning nature of the narrative, and the connection is more with the *subtext* of the narrative.

The Fifth Element exhibits rich production design content with many innovative but referential design elements. However, the overall level of subjunctivity is not high. Its framework is oriented towards paradigms that are easily understandable by the audience; the design content plays a role in establishing the world as futuristic, but does little else. Again, this ties in with the intent of the movie, which is aimed at entertainment rather than interrogation.

6.6.2.4 Leakage

Leakage is an original concept developed for this study that describes a specific type of framework failure. In the same way that contemporary societal issues pervade science fiction movies, there is also sometimes a 'leakage' of concurrent design content – the future looks much like the cutting



Figure 6.15
Leakage: chairs by Olivier Mourgue,
1965, in *2001: A Space Odyssey's*
spacestation.
Bizony, 1994. p. 30

edge of concurrent design. While Kuhn labels this 'reflection', the term *leakage* is better applied to the design content, as the designers are intending to represent the future but are in fact unintentionally representing 'the now'. Movies that show strong elements of leakage include *Metropolis*, *Forbidden Planet*, some aspects of *2001: A Space Odyssey*, *Red Planet*, *The Fifth Element*, and some details of *Minority Report*.

One effect of leakage is to make the future seem comfortable through familiarity, and it is possible that creating futures that are non-threatening is what the production team have in mind in these movies. However, it is also possible that design content that is too comfortable interferes with the suspension of disbelief that is an important element in the audience's cinematic experience.

There are several reasons why leakage might occur. One possibility is that instead of creating and exploring a fictional design culture of the future (with all the future history between now and then), production designers have defaulted to working with what they're familiar with. It is also possible that more pragmatic issues such as budgetary restrictions inhibit the design and construction of new products and interiors. Chairs in particular seem to be wedded to the time of the movie's production. This is evident in the remake of *The Planet of the Apes* (dir. Burton, 2001), *Forbidden Planet*, *2001: A Space Odyssey*, and *Metropolis*.

However, a strong sense of framework as a design tool should highlight and address the impact of leakage.

6.5.2.5 Design Classics

In complete contrast to leakage, a few movies use design classics as significant production design elements. *Gattaca* (dir. Nicol, 1997) and *Men in Black* (dir. Sonnenfeld, 1997) show the deliberate and intelligent use of design classics to create futures that are both futuristic and familiar at the same time. As these design classics exist outside their original context, they have become effectively 'timeless' and their use in *Gattaca* creates a future that is equally timeless while remaining familiar. *Time Cop* (dir. Hyams, 1994)



Figure 6.16
Classic design: *Men in Black* (dir. Sonnenfeld, 1997) uses furniture and interiors inspired by American architect Frank Lloyd Wright. (Image capture dir. Sonnenfeld, 1997)

also uses this approach to divorce design content from specific time periods.

This is a highly intelligent and sensitive approach to the use of design.

Gattaca uses a variety of classic furniture and products, and shares with *Men in Black* the use of Frank Lloyd Wright architecture. *Men in Black* further uses furniture and interiors inspired by Wright, as well as furniture by Charles and Ray Eames in the music video that promoted the film.

Gattaca takes an approach to design that recognises the essentially timeless nature of design classics. While there are new products that have been designed especially for this movie, the major design elements have been selected from the pages of design history publications. The building occupied by the titular Gattaca Corporation is another Frank Lloyd Wright design (the Marin County building) and works as a set owing to its clean aesthetics and lack of defining detail (the same building was used in George Lucas's 1971 movie *THX1138*). Other classic designs that appear are pieces of Bauhaus furniture, and vehicles such as the Citroen D series and Rover 90. The existence of these cars in this future is justified by sounds that imply the retrofitting of a motive power other than the petrol engine. By using these elements intelligently, *Gattaca* avoids being trapped in time by the design of products that might be 'contaminated' by the shortsighted use of contemporary design products and practices. This is a clever approach to the creation of futures: it uses design in a way that celebrates rather than denigrates. This approach is completely deliberate – and shows an understanding of design that trumps that shown by most science fiction movies.



Figure 6.17
Méliès' early experiments with special effects (1902) presaged science fiction cinema's relationship with special effects technologies. Audiovisual Institute, <http://www.iaa.upf.es/~berenguer/text/os/fabricalig/melies.gif>

6.5.2.6 Special Effects

As noted in Section 4.5, the earliest science fiction movies were based not on any sense of a science fiction narrative, but were more interested in exploring the possibilities of 'special effects'. The special effects used by Méliès in his 1902 production *La Voyage Dans la Lune* (*A Trip to the Moon*) were distinctly cinematic and quite different conceptually from the traditional special effects used on the stage at the time; they included stop-motion photography, slow motion and reversed motion, split-screen multiple exposures, and models combined with live action (Rickitt, 2000).

What was established at this point in the history of science fiction cinema was its long-standing relationship with special effects. The subsequent history of special effects frequently intersects with science fiction cinema, as the ability to deliver the visions of art directors, designers and directors is constrained by the technology that exists to realise these visions on the screen (Rickitt, 2000).

Equally, following the example set by Méliès (and for many of the same reasons) science fiction productions are often used to showcase special effects developments. The delivery of genuinely believable aliens, spacecraft that look like they're flying, and weapons that look like they're firing, amongst many other fantastic things, can have a substantial impact on the effect of a film. There have been enormous advances in special effect technologies since Melies's first experimentations in the early 1900s. A glance through the history of special effects suggests that many of the groundbreaking technological developments have been instigated by, or showcased in, science fiction productions. *Metropolis*, *The Invisible Man* (dir. Whale, 1933), *Forbidden Planet* (dir. Wilcox, 1956), *2001: A Space Odyssey*, *Star Wars*, *Tron*, *Terminator 2: Judgement Day* (dir. Cameron, 1986) and *Star Wars Episode One: The Phantom Menace*, among many others, have contributed to these developments. In his book *Special effects: the history and technique*, Rickitt identifies 40 films that he considers landmarks in the development of special effect technologies. Of these, 27 exhibit science fiction themes, demonstrating how important science fiction films are to special effects and vice versa. (Rickitt, 2000)



Figure 6.18
The design ideas in *Terminator 2: Judgment Day* (dir. Cameron, 1991) were channelled by the then-emerging digital special effects technologies. (Image capture, dir Cameron, 1991)

Star Wars Episode 2: Attack of the Clones exhibits design ideas that would have been virtually impossible with pre-digital special effects technology, but instead of being foregrounded or showcased, they become part of the background, creating a texture that rivals *Blade Runner* for its depth and richness.

The relationship between design and special effects is another aspect of the relationship between science fiction cinema and industrial design that remains unexplored in any depth.

6.5.2.7 Special Effects and Framework

The *Star Wars* movies are useful for exploring the impact of special effects on the sense of framework, as their scope covers a wide range of cultures and technologies, and the production processes of the movies themselves cover a span of 25 years and a revolution in production and special effects technologies. In addition, the order that the story is told in is not the order the movies were filmed in (see table 4).

Narrative order	<i>Star Wars Episode 1: The Phantom Menace</i>	<i>Star Wars Episode 2: The Attack of the Clones</i>	<i>Star Wars Episode 3: The Revenge of the Sith</i>	<i>Star Wars Episode 4: A New Hope</i>	<i>Star Wars Episode 5: The Empire Strikes Back</i>	<i>Star Wars Episode 6: The Return of the Jedi</i>
Filming order	1977	1980	1983	1999	2002	2005
	<i>Star Wars Episode 4: A New Hope</i>	<i>Star Wars Episode 5: The Empire Strikes Back</i>	<i>Star Wars Episode 6: The Return of the Jedi</i>	<i>Star Wars Episode 1: The Phantom Menace</i>	<i>Star Wars Episode 2: The Attack of the Clones</i>	<i>Star Wars Episode 3: The Revenge of the Sith</i>

Table 4
Filming & chronological order for the
Star Wars movies

The consequence of these two issues – advances in special effects technology and the filming the movies out of sequence – means that in many ways, the framework of the chronologically later *Star Wars Episode Four: A New Hope* does not jell with that in *Star Wars Episode One: The Phantom Menace*.



Figure 6.19
Star Wars' Millennium Falcon was designed in the era of blue screens and physical models. (Cotta Vaz & Hata, 1994. p. 20),

The spacecraft in *Star Wars Episode Four: A New Hope* are worn, temperamental, used and abused. Director George Lucas envisaged the *Star Wars* universe as being "used" rather than shiny (Cotta Vaz & Hata, 1996. p.10), with the design elements being as much background as part of the action. The iconic spacecraft *Millennium Falcon* was inspired by the shape of a hamburger, and realised in an approach which would be familiar to the architects of high-tech architectural icon the Centre Georges Pompidou in Paris: "guts on the outside" (Cotta Vaz & Hata, 1996. p. 21). In the second movie of the earlier trilogy, *Star Wars Episode Five: The Empire Strikes Back*, the *Millennium Falcon* spends much of its screen time being repaired after breaking down yet again while attempting to escape from the clutches of the Empire. This is not technology as hero: it is technology presented as



Figure 6.20

The digitally generated 'battle droids' in *Star Wars Episode 1: The Phantom Menace* (dir. Lucas, 1997) were a far more useful fighting force than the human Storm Troopers that followed them. (Image capture, dir. Lucas, 1997)



Figure 6.21

The Storm Troopers are a less reliable fighting force than the 'battle droids' but entered the *Star Wars* universe before digital special effects. (Image capture, dir. Lucas, 2002)



Figure 6.22

The mirrored surface of the Queen's spaceship from *The Attack of the Clones* could not have been achieved before digital special effects. (Image capture, dir. Lucas, 2002)

unreliable, temperamental servant, and the design of the spacecraft communicates this to some extent.

By contrast, on the chronologically earlier *Star Wars Episode One: The Phantom Menace*, Lucas's 'used' universe has disappeared, to be replaced by cleaner spaceships and spaces with an Art Deco feel which is intended to predate the 'guts on the outside' aesthetic of the original movies. The framework established by the first trio of movies is relatively homogeneous: the spacecraft, for example, all feel related by their shaping and detailed construction. While the design content of *Star Wars Episode One: The Phantom Menace* is broader and probably more realistic in its range of designs, the design content of what is chronologically the later movie does not look like a development from it. For example, in *Star Wars Episode One: The Phantom Menace* the Empire uses robotic 'battle droids' (which are digital creations) as its soldiers: these are replaced in *Star Wars Episode Four: A New Hope* by the human Storm Troopers, who are a far more fallible fighting force. There is nothing in the narrative that explains why the weaker human soldiers might have supplanted the chronologically earlier battle droids.

The impact of special effects technologies on the design elements of the movies is demonstrated by the design of two spacecraft: the *Millennium Falcon* in the earlier trilogy, and the Queen's spacecraft in the later movies. The digitally generated Queen's spacecraft in *Star Wars Episode 2: Attack of the Clones* has a highly reflective, chrome-like exterior of compound curves and fins. Realising a design like this in the pre-digital era would have been extremely difficult. It would have required the production of a large-scale, highly reflective model (a significant challenge by itself), and filming the model would have had added complications owing to reflections of the blue-screen and production machinery on the surface of the model (these processes are described in Rickitt, 2000). By comparison, the non-reflective *Millennium Falcon* in *Star Wars* was realised by models filmed using the then state-of-the-art blue-screen method, and the model itself was constructed from thousands of plastic kitset components, which lends the spacecraft its 'guts on the outside', detailed, technical feel (Cotta Vaz & Hata, 1996).



Figure 6.23
This gyroscopically stabilised robot from *The Attack of the Clones* could not have been achieved before digital special effects. (Image capture, dir. Lucas, 2002)

This may be part of a grand design, but in the absence of any evidence to the contrary, it is difficult to escape the conclusion that the producers and designers of the later movies have followed the promise of digital special effects technology in the design of these technical elements rather than remaining faithful to the 'framework' established by *Star Wars*. This is reinforced by the design content of *Star Wars Episode 2: Attack of the Clones*, which introduces such design attractions as gyroscopically stabilised robots (which look suspiciously like they have been influenced by Syd Mead): a technology that it is possible to represent with digital technology, but nowhere visible in the original, non-digital *Star Wars* universe.

However, generally individual movies do not exhibit the limitations of special effects technologies, except in hindsight if older movies are compared with newer ones. New technologies bring new opportunities, but as special effects pioneer John Dykstra observed when asked about the impact of special effect developments:

What's happened with the advent of digital imaging is that there is no limitation now... If you can think of it, you can do it. The problem, however, is that you can do anything, and in many cases it is questionable whether or not what's being done is worth being done. (Dykstra: Story trumps F/X, 2004. <http://www.scifi.com/sfw/current/news.html>).

By removing the limitations of non-digital special effects processes, digital imaging places a premium on robust design processes that develop meaningful design content. This includes developing a sense of framework that guides design decisions at the cultural and technological levels as well as the design of the products themselves.

6.5.3 Key Examples

The three examples in this section show how the design issues identified in the previous section apply to three specific movies. The movies are

presented chronologically: two are part of the canon (Scalzi, 2005), while the third example was used on the basis that there is documentation of the design processes used by the production team. It should be noted that this analysis is only identifying the obvious design issues, and that a full analysis of the meaning and use of the design content of each movie is a study in its own right.



Figure 6.24
Metropolis cityscape: the enduring
image of the movie. Kino
International.
<http://www.kino.com/metropolis/>

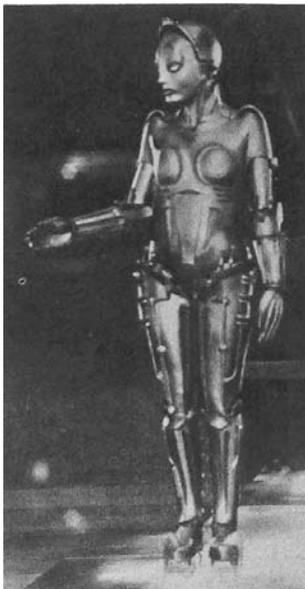


Figure 6.25
The feminine robot from *Metropolis*:
science fiction cinema's first iconic
robot.
(Image capture, dir. Lang, 1926)

The design issues are discussed within these four categories:

- Intent: how was the design content used to reinforce the intent of the movie?
- Framework: how well understood is the idea of framework?
- Leakage: are there any examples of leakage? Is this deliberate or unintentional?
- Icons: has the production used or created any design icons?

There is a short description of these movies in *vii. Science Fiction works used as examples in the text.*

6.5.3.1 *Metropolis* (1926)

- *Intent:* As the subtexts in the narrative are full of allegory (Clute & Nicholls, 1999), the focus of the movie is more on the imagery of the city as machine and people being subservient to that machine than on technology for the sake of technology. There are images of workers being sacrificed to a machine-god, and it is clear that the intent behind the production design in *Metropolis* was to imbue science and technology with a mystical rather than realistic quality. There is a high level of interrogation in this movie, and much of this is expressed through the production design.
- *Framework:* The set and architectural design for *Metropolis* is strong and shows some exploration of futures, but much of the technological design does not demonstrate adherence to the same framework. Given the disparity between design aspects of this movie, it is could be concluded that any framework for *Metropolis* was not important, not defined, not recognised, or not adhered to. In hindsight it can be seen that the



Figure 6.26
The videophone: the single most interesting technological advance in *Metropolis*. Kino International
<http://www.kino.com/metropolis/>

- technology of the future as glimpsed in *Metropolis* was mostly a straightforward, limited extension of what was in use at the time.
- *Leakage*: There is a lot of leakage in *Metropolis*. The broad vision of the future shown in *Metropolis* is one of super cities and skyscrapers, but the detail includes 1920s cars and propeller-driven biplanes as modes of urban transport, and the mayor of Metropolis uses a communications console that would have been at home in a 1920s switchboard. These elements detract from the sense of futurism that the production design achieves in other areas.
 - *Design icons*: The architecture is one of the lasting impressions of the movie. The design of the skyline of the city of *Metropolis* was inspired by Lang's first view of the New York skyline (Bloch, in Peary (1984)) and the images frequently associated with the movie relate to the architecture. One design element in *Metropolis* has achieved iconic status within science fiction cinema: this is an exquisitely designed feminine robot that could hold its artificial head high in any science fiction movie made to date. The second item of interest is a device that is clearly a videophone - an idea well ahead of its time in 1926.

6.5.3.2 *Blade Runner* (1983)

Intent: Like *Metropolis*, the dystopian future in Ridley Scott's *Blade Runner* is dark and gritty, and much of the city is wet, littered, graffitied and abused. The predictive intent of the production design content is clearly evident, and is mixed with an element of interrogation. As discussed earlier in Section 6.3, the production design processes were based on an understanding of the subtexts in the narrative rather than any specific aspect of the story, and the balance of prediction and interrogation fits the subtexts very well. The entire movie is dark, with low light levels in both inside and outside settings.



Figure 6.27
The detail of *Blade Runner*'s cityscape is part of the framework that supports the subtexts of the movie.
(Image capture, dir. Scott, 1982)

- *Framework*: This is the movie that gave Syd Mead such a high profile in both the industrial design and science fiction communities, and his influence is visible in both the individual design elements and in the strong sense of framework. While Sobchack has described *Blade Runner* as displaying "excess scenography" (Sobchack, 1987. p. 262), the design content has a richness and depth that is more easily



Figure 6.28
The Spinner police car designed by Syd Mead for *Blade Runner* (Image capture, dir. Scott, 1982)



Figure 6.29
The magnetic levitation urban transport system proposed by *Minority Report* uses the architecture as a roadway. (Image capture, dir. Spielberg, 2002)

recognisable from a contemporary viewpoint as a possible future than most science fiction movies. The 'retrofitting' approach developed by Syd Mead, Ridley Scott and the remainder of the production team proved highly influential, and Syd Mead's intuitive understanding of framework lends an air of reality to the production design.

- *Leakage*: There is no discernible leakage in this movie. There are familiar objects, but they are retrofitted or otherwise modified to explain their presence in this future.
- *Design icons*: The film has both created icons and used at least one real, well-known architectural landmark as a set. The influence of Syd Mead is immense, with elements such as firearms and vehicle exteriors and interiors being resolved to a very high degree. Mead's design for the Spinner (noted in Section 6.3.1) is possibly the archetypal flying car that was a staple of earlier science fiction narratives. The Bradbury Hotel is the recognisable set; both the street level pillars and the atrium roof are featured in the movie. The name of the hotel is a reference to science fiction author Ray Bradbury (Sammon, 1996).

6.5.3.3 *Minority Report* (2002)

- *Intent*: The production design of *Minority Report* is dense, complex, and as much part of the character of the movie as the narrative. While the narrative plays with an idea that could be considered fantasy (precognition - seeing the future), the subject is dealt with in a science fiction way, with the emphasis on interrogating the morality of the idea. The production design of the movie is intensely science fictional, and leans heavily on a set of predictive and interrogative design ideas. As noted in Section 4.7.2, director Steven Spielberg created a 'Delphi panel' to help create the world of *Minority Report*, and the breadth of design understanding that this brings to the movie rivals that of *Blade Runner*. However, where both *Blade Runner* and *Metropolis* are dark and disquieting, *Minority Report* is generally light and bright despite the interrogatory themes and black humour in both the narrative and the production design.
- *Framework*: The movie has a very strong sense of framework, mixing new and old, but achieves a light and open visual feel. *Minority Report*



Figure 6.30
Defined hand movements and gestures control the virtual interface developed by John Underkoffler. (Image capture, dir. Spielberg, 2002)



Figure 6.31
The assembly processes of Harald Belker's conceptual Lexus are featured in *Minority Report*. (Image capture, dir. Spielberg, 2002)

uses similar ideas to *Blade Runner*: signature vehicles, transport systems, unique weapons, vernacular design, communication products, and commercialism. What sets *Minority Report* apart from the majority of science fiction movies is the sheer depth of detail of design elements that ranges from inspirational and highly functional to banal, ugly, irritating, and dysfunctional. This is a fictional world whose design texture represents the range of reality.

- *Leakage*: The sole example of leakage is the presence of an office chair from approximately 2001 in the future of 2056. It is interesting to note that *Minority Report* is not the only science fiction film to noticeably use contemporary office seating in future worlds.
- *Design icons*: Two products designed for *Minority Report* have become highly visible. The first is a Lexus car, exemplifying both the future and product placement at the same time. The car gained Harald Belker, the designer, some attention in design circles: the vehicle is at the leading edge of contemporary automotive design. The robotic assembly plant for the Lexus also features in one of the action scenes. The second design that attracted attention is a virtual workstation used to access and manage images. The operator virtually moves and controls the images using a gestural sign language developed by John Underkoffler, a graduate of the Massachusetts Institute of Technology Media Laboratory programme (Clarke, 2002).

6.5.4 Industrial Designers and Science Fiction Cinema

6.5.4.1 Introduction

In Section 5.14, science fiction cinema was identified as part of a cause and effect cycle involving industrial design and science fiction. This section uses an online discussion form on the Core 77 website (www.core77.com) as a basis for exploring the supplementary study question 'are industrial designers interested the design content in science fiction movies?'

www.core77.com is constructed as a resource for industrial design students, and is used by professional industrial designers as well. The website is administered from the United States, but has contributions from designers all

over the globe. Areas on the website include discussions of design schools, the use of software, and employment opportunities.

In 2002, a discussion thread was started that canvassed opinion about industrial design at the movies. Who started the thread has not been determined, although it is likely that it was one of the site administrators. The thread is posted at <http://www.core77.com/chit-chat/film.html>, retrieved 16th May 2006. The full text of the discussion thread is appended, and all comments included here are verbatim. The question was:

What is the greatest ID film of all time and why? Is it because it stars a designer (or a spy pretending to be a designer), or because the set designs are great, or because the settings are full of great design? If you can't think of an answer to this question, then why has design been all but ignored in most mass media?

There are two subtexts to this question. One is the implication that it will be difficult to answer as industrial design is rarely mentioned in movie narratives (“If you can't think of an answer to this question...”). This aspect, along with the subsidiary “why has design been all but ignored in most mass media?” question, implicitly directs responses towards design in the narrative of the movie rather than towards the production design content.

73 responses were posted on the discussion thread before the thread was archived. This is a reasonable number in terms of a statistical sample, but it must be noted that this sample does not represent a cross-section of the industrial design profession.

6.5.4.2 Quantitative Analysis

Production design / design in the narrative

The pattern of response to the question was for respondents to nominate a film (or films) and then discuss / justify their choice. Each mention of a specific film is considered a ‘vote’.

- Number of respondents: 73
- Number of separate films nominated: 70
- Total number of votes 150
(i.e. several films were nominated several times):

The nominations break down into two broad categories:

- Films noted for the use of design in the *narrative*: i.e the story involves a designer; e.g. *Tucker* (dir. Coppola, F.F. 1988), or has design-related themes; e.g. *Power of Ten* (1977) by American design partners Charles and Ray Eames;
- Films noted for their *production design*.

Of the 70 films identified:

- 67 were nominated for their *production design*
- 3 were nominated for design themes in the *narrative*.

Discussion: Production design / design in the narrative

Despite the implicit direction in the initial question that is directed towards industrial design in the movie narrative, the vast majority of the responses were based on production design. It can be hypothesised that industrial designers are sensitive to movie *production design*.

Science fiction / not science fiction

Of the 67 films nominated for their production design, 39 (i.e. 58%) are science fiction films. Significantly, of the 150 votes, 111 (i.e. 74%) were for science fiction films.

The percentage of science fiction films at any one time represented in the 100 highest grossing movies is around 25% (*100 highest grossing movies, international*, Internet Movie Database, <http://www.imdb.com/boxoffice/alltimegross?region=non-us>). The nominations for science fiction movies are over-represented in comparison to non-science fiction movies.

The movies that received the most votes are all science fiction and are all noted for varying aspects of their production design:

- *Blade Runner* (21 votes)
- *Brazil* (10)
- *2001: A Space Odyssey* (9)
- The *Star Wars* movies (7)
- *Gattaca* (5)

13 other science fiction movies received more than one nomination – 37 votes in total.

By contrast, the most votes for non-science fiction movies are:

- *North by Northwest* (dir Hitchcock, A. 1959) (2),
- *The Hudsucker Proxy* (dir. Coen, 1994) (2),
- *The Power of Ten* (2).

All the remaining movies in the non-science fiction list received one vote (26 films / one vote per film).

Discussion: science fiction / not science fiction

It would be possible to suggest that the first response to the question – which mentioned *Blade Runner* – focussed the remainder of the replies on science fiction movies. However, non-science fiction movies were mentioned regularly through the responses and the focus would then return to science fiction movies. This suggests that science fiction cinema is a genuine interest for this group. It is very clear that this sample of industrial designers respond to science fiction movies and the production design of these movies.

6.5.4.3 Qualitative Analysis

There are two themes of interest in the responses:

1. Science fiction cinema inspired some of these respondents to become industrial designers.
2. That there is an implicit connection between industrial design, movies, and science fiction.

These two issues are demonstrated in the following quotes lifted (verbatim) from different respondents:

Examples: Inspiration

I say Bladerunner [sic] is the best - I think it's a movie that inspired many to become designers. Gattaca was also pretty good.

My two cents to this question: I think the main reason I am an I.D. student is due to space and technology-related movies of the mid- to late-'60s, and yes, of course, "2001" is up there, but I remember watching "Marooned" as a little kid at the drive-in and marvelling at the cool spacecraft David flew to co-rescue the marooned Americans (the Russians helped). I guess we really owe it all to R. Loewy and his work with Skylab, but I wonder if he had a hand in that movie...

Discussion: Inspiration

This aspect of the industrial design / science fiction relationship is clear: the production design of some movies is perceived as exciting enough to have inspired some viewers to become industrial designers. This supports the idea of 'cause and effect' proposed in Section 5.13.

In the email interview discussed in Section 6.3, Syd Mead was directed to this discussion thread, which includes many of the films that he has worked on (*Blade Runner*, *Tron*, *2010*, *Aliens*, and *Strange Days*). Mead was asked if he had an opinion about why people might have arrived at industrial design through an interest in the production design for science fiction movies. His response was:

All of those films employed technologically advanced artefacts to illustrate the story line. I used my industrial design rational [sic] and methodology which lends a curious kind of appropriateness to the visual image. If anyone appreciates that kind of attention to the representation, they already have an affinity for solving design problems. (Mead, personal communication, 2005)

Mead links industrial designers and science fiction through a common interest in the technologies represented in science fiction cinema. He is also suggesting that industrial designers might be sensitive to the contexts in which these designed products exist.

Examples: Implicit Connection

My all time favourite id movie is Stanley Kubricks 2001: a space odyssey. This movie is an industrial design head trip, really. Also, honourable mention should go to Gerry Anderson's "Journey to the far side of the sun", this movie has cool cars, cool (realistic) space vehicles, and cool fashions to boot. Quite actually, all of Gerry Andersons productions are Fab. - Stingray, Thunderbirds, Capt. Scarlet, and esp. UFO and space: 1999. All ID people should be aware of this.



Figure 6.32

In *Brazil* (dir. Gilliam, 1985), the hero fights for possession of his part of a desk, which he shares with a person on the other side of the wall.

Sciflick.com

http://www.sciflicks.com/brazil/images/brazil_03.html

There are only two movies which deserve that title: Stanley Kubrick's "2001: A Space Odyssey" and Terry Gilliam's "Brazil". I can't make up my mind between the two... Maybe "Brazil". It's a masterpiece, it's what movies are all about. It's a pure work of art, a work of a genius.

Definitely "Metropolis" for mechanics, and I believe it's titled "Follies of 1939"³, but the Busby Berkley [sic] musicals were interesting in that he used humans to construct moving shapes to go with beautiful Art Deco sets.

Clockwork Orange⁴, 2001, Dr. No⁵ (Q is definitely the man, and I have been lucky enough to do some similar work for our boys in black, so I appreciate the diversity and clever nature of his designs) Dune⁶, Blade Runner, Star Wars yes, but Fifth Element is the best overall in my sordid opinion for punchy design of costumes and sets

³ dir. Schünzel, 1939

⁴ dir Kubrick, S.1971

⁵ dir. Young, 1962

⁶ dir. Lynch D. 1984

and the actors themselves are strategically different looking. Love Milla's hair color!

In some ways this is the most interesting comment:

2001:a space odyssey. You probably don't need to ask why.

Discussion: Implicit Connection

Within the context of this study, the science fiction movies that are nominated present no surprises. *Blade Runner* is notable for its connections with cult author Phillip K Dick, the quality of its direction, the density of its production design, and the adult nature of its science fiction. *2001: A Space Odyssey* combines the moviemaking reputation of Stanley Kubrick, a strong science fiction idea, and strong production design and special effects.

Andrew Nicols' 1997 movie *Gattaca* is an interesting nomination. As noted in Section 6.5.2, *Gattaca* uses its production design elements in a very different way from the vast majority of science fiction movies. The production design lacks any hero products or novum in the way that *Blade Runner* has, but there is a high degree of subtlety in the way that design classic vehicles and furniture are used.

There is a very clear thread running through these responses: that these industrial designers are appreciative of the production design for science fiction movies. These comments mention the cars, the technology, and the spaceships – all industrial design artefacts that exist in science fiction worlds.

The last comment is the most interesting, as the respondent assumes that everyone else will be able to see the same things in *2001: A Space Odyssey* that they can, and that these things are so obvious they don't need to be stated.

6.5.5 Syd Mead on Industrial Designers and Science Fiction

Part of the email from Syd Mead noted in Section 6.3.2 included his response to the following question:

Do you think that industrial designers are any more or less interested in science fiction than any other professional group? Do you feel that industrial designers SHOULD be any more or less interested in science fiction than other professional groups? If so, why?

Mead responded:

I would say 'yes' without any particular proof, but anyone trained to appreciate proportion, suitability, morphology will have an appreciation when those qualities are obviously dramatized as story artefacts, especially when the design projects a robust presence. I would think that designers would be more interested in science fiction than other professions as it IS about design; the visible result of solving an elaborate combination of morphology, function and unique appearance. The second most appreciative profession would be architects; not the 'run of the mill' crowd, but the creative architects who push their particular envelope of imagination coupled with technical feasibility. (Mead, S. personal communication, 2005) (Emphasis added).

Mead's response to the question underlines that he sees no dividing line between industrial design and science fiction, and that two areas share many core ideas.

6.7 Case Studies: Conclusions

As demonstrated in Section 3.8.2 the role of industrial design is mediation. These four case studies show industrial design exploring many ways that this

job can be approached.

Figure 3.14 in Section 3.8.2 identified five ways that industrial design mediates between the present and the future. All of these explorations are evident in the case studies.

A scenario-based approach to the creation of futures is apparent in the work of Syd Mead, and in the role and practice of industrial design for science fiction cinema. The design of specific products for a movie involves forecasting or anticipating possible changes in technology and culture. Inherent in this process is mediating the role of people in the interaction between products and systems.

There are three additional layers of mediation specific to design for the cinema:

- Mediating between special effect technologies and the production team.
- Interpreting the narrative into design terms (creating and applying a sense of framework).
- Communicating the nature of these futuristic products to the audience.

The analysis of the www.core77.com 'Design on Film' discussion thread showed that the design aspects of science fiction cinema influence a subset of the audience: industrial designers.

As someone with a science fiction background, Bruce Sterling is intensely focussed on technology and the future, and sees industrial design as playing a crucial role in the creation of a future that minimises the impact of manufacturing and consumption. This reinforces the proposition made by this study that the role of industrial design is to mediate between the present and future needs of users, manufacturers and society.

Woven through all of these case studies is the role of science fiction: mediation between the present and the future so that explorations of the future guides decisions that we make today. This function is enriched by the role of industrial design, which focuses on mediating the technologically based relationship between now and the future.

6.8 Summary

The subjects of the case studies in this section were chosen as they illustrate the ideas discussed in the previous chapter.

Syd Mead is a key figure in this study as he has a profile in both the industrial design and science fiction arenas based on his provocative illustration work and production design for science fiction cinema. His work displays a high level of sensitivity to the idea of framework, and this sensitivity is a key aspect of his illustrative and production design work. Mead sees no difference between designing for the real world and designing for a science fiction project.

Cyberpunk author and critic Bruce Sterling is another key figure to this study based on his attitude to industrial design. He is highly enthusiastic about working with industrial designers owing to their pragmatism. Sterling has explored design-related ideas through his Viridian Design movement and as Visionary in Residence at the Art Center College of Design, and sees science fiction's sense of wonder in the work of Norman Bel Geddes and other designers.

There is a very strong relationship between science fiction cinema and industrial design. This study proposes that industrial design issues in science fiction cinema can be discussed under these headings: chronology; framework; intent; leakage; design classics; special effects.

The design content of a movie could be considered as time travel. Use of design elements that are too closely tied to the time of the production of a specific movie can be described as leakage, although some science fiction movies display the intelligent use of design classics to create timeless futures.

The term 'framework' can be used to describe the network of issues and ideas that shape the design of systems and products for a movie.

Framework is an important concept for science fiction movies as it lends an air of consistency to the design content.

The production design of a science fiction movie is a tool that the production team can use to support the intent of the narrative and the production team. The intent behind the production design for science fiction movies can be charted with a taxonomy.

Special effect technologies have an impact on the nature of the design elements shown on screen. The broader possibilities inherent in digital imaging technologies place an emphasis on the concept of framework as a tool for guiding production design decisions.

Industrial designers on the *Core 77* website are sensitive to the production design content of science fiction movies. Some of these industrial designers were inspired to become designers by the production design of science fiction movies.

The mediation roles of industrial design (employing forecasting and responsibility) and science fiction (employing anticipation and interrogation) are evident in these three case studies.



Chapter 7: Conclusions

7.1 *Introduction to the chapter*

The study aimed to outline a theory that describes and analyses the relationship between industrial design and science fiction. What has been mapped out in this study is an emerging theory, and in industrial design terms, this emerging theory could be considered a prototype. At this stage of an industrial design project, a prototype product would be produced to assess how the design proposal performed against expectations.

Therefore, this chapter summarises the findings of the study to assess how it performed against expectations. It firstly discusses the four themes in the hypothesis and what was learned about them. The chapter concludes that the evidence developed through the study supports the validity of the hypothesis. The relevance of the study is also discussed. The research methods used in the study are discussed and reviewed in the second part of the chapter. This section also outlines how the model could be further tested and developed.

The last part of the chapter applies a model of reflective practice to what was learned from the study, about both the topic and about research processes.

7.2 *What was learned about the hypothesis?*

The four aspects of the hypothesis that were proposed in Chapter 1 are:

1. The roles of industrial design and science fiction are based on parallel ideas.
2. Industrial design is suffused with, and sympathetic to, science fiction thinking.
3. There is a cause and effect relationship between aspects of industrial design and science fiction. Science fiction cinema is a key element in the cause and effect relationship.
4. Science fiction cinema performs a key function in the role of science fiction, and can be employed to explore and discuss the roles of industrial design and science fiction.

7.2.1. The roles of industrial design and science fiction

The roles of industrial design and science fiction are based on parallel ideas.

The identification and comparison of the roles of these areas is a key element in this study. In Chapter 3, I proposed that the role of industrial design is *mediation* between today and the future, and that *forecasting* and *responsibility* are the tools that industrial design employs to perform this role. In Chapter 4, my analysis of the literature identified the role of science fiction as *mediation* between the future and the present, and that science fiction uses the overlapping ideas of *anticipation* and *interrogation*.

There are two parallel ideas in these roles. For industrial design to be able to make informed design decisions, it must mediate between the many demands made during the design process. Understanding the implications of these decisions requires a sense of the short and long-term implications of these decisions, whether they are directly focussed on how the product might be used, or on minimising environmental impacts of the product over its lifecycle.

In the last section of Chapter 3, I argued that industrial design is as much focussed on the future as it is on the present. I have also argued that science fiction is focussed on the present, and uses what is learnt in its explorations of possible futures to influence decisions being made today. Science fiction shares this task with industrial design.

These are the parallel ideas proposed in the hypothesis, and I consider that the hypothesis has been supported by the analysis of the literature. The analysis of the case studies further supports the hypothesis, and shows that Bruce Sterling is committed to using both industrial design and science fiction to influence decisions that might adversely affect the future. Mediation, forecasting responsibility, anticipation and interrogation are apparent in science fiction cinema. The design themes that I have proposed in science fiction cinema also

identify a number of ways that design can be employed to support the roles of both industrial design and science fiction.

For industrial design to perform its role, it needs a clear and comprehensive understanding of the contexts that its products might be used in. The literature highlighted, in the areas of design classics and good design, that there may be many layers of context surrounding a product. The methods developed for design research, married with the methods widely used by science fiction, might provide additional tools for anticipating and interrogating design decisions.

The relationship between these ideas has been charted graphically in Figure 7.1. I consider that this aspect of the hypothesis is supported both in the literature and by the case studies.

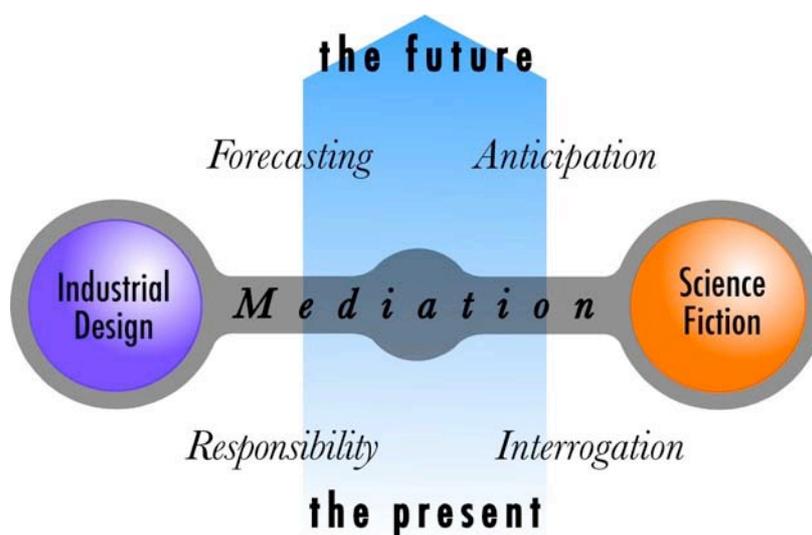


Figure 7.1
The parallel roles of industrial design and science fiction.

7.2.2 Science fiction thinking

Industrial design is suffused with, and sympathetic to, science fiction thinking.

I believe that the analysis of the literature and the case studies and other data shows that this hypothesis is valid. The close connection between the way that

industrial design and science fiction operate is evident in several areas of industrial design, and is mapped out through the model proposed in Chapter 5: Industrial Design and Science Fiction. As mentioned initially in Section 1.4, and reinforced in Chapter 4, the two key themes behind science fiction's explorations of the future are *anticipation* and *interrogation*. It is the conclusion of this study that both these ideas are evident in the parallel ideas of forecasting and responsibility in industrial design, and exemplify the idea of 'suffusion'.

As an illustrative example, design processes and ideas that are suffused with *anticipation* and/or *interrogation* are; forecasting processes, including the use of scenarios; design competitions; provocative semi-commercial products such as show cars; provocative conceptual products such as the work of Norman Bel Geddes and Luigi Colani; the common interest in new things, innovation or nova.

'Sympathetic to' science fiction thinking suggests that there is an element of cause and effect. Syd Mead, for example, as a person who works in both science fiction and industrial design, sees little if any difference in the processes that he uses for each area. Bruce Sterling also sees many ideas and directions as being common to industrial design and science fiction. Streamlining shows industrial design's sympathy with science fiction ideas.

I believe that this study has demonstrated the ideas of 'suffusion' and 'sympathy' in an historical sense, and identified the concepts in the work of Syd Mead and Bruce Sterling. The applicability of the idea to contemporary practice is implied, but is a fruitful topic for further research.

7.2.3 Cause and effect

There is a cause and effect relationship between aspects of industrial design and science fiction. Science fiction cinema is a key element in the cause and effect relationship.

Cause and effect was analysed in two places in this thesis. Cause and effect ties together two ideas in Chapter 5: Industrial Design and Science Fiction: the Streamlining movement, and industrial designers and science fiction cinema. Science fiction cinema was then elaborated on in the Case Studies chapter, and related to the work of Syd Mead and analysis of an online discussion on an industrial designers website. Chapter 6 also reviewed Bruce Sterling, his enthusiasm for industrial design and industrial designers, and the work that he is doing through the Viridian Design movement and as 'Visionary in Residence' at the Art Center College of Design. This work explicitly links industrial design and science fiction.

I believe that my analysis shows that Syd Mead and Bruce Sterling are strong illustrations of the validity of the cause and effect cycle. Mead and Sterling are visible and productive people, working in industrial design and science fiction with a high degree of enthusiasm for both areas. Syd Mead has had a measurable and obvious impact on both industrial design and science fiction. Sterling's impact on industrial design through his Viridian Design initiative may not be evident immediately, but his impact on Art Center design students will be apparent shortly, and his presence in science fiction is undeniable. Sterling is writing science fiction and living design.

As an element of cause and effect, science fiction cinema is both implicit and explicit. The production design of science fiction cinema explicitly exhibits the impact of much industrial design thinking and activity. It was demonstrated in the analysis of the *Core 77* discussion thread that some industrial designers were motivated by the design of science fiction movies to become industrial designers. This is more implicit than explicit, but appears identifiably part of the cause and effect cycle.

To take one example I have identified, Streamlining is both implicit and explicit, and shows science fiction in both its texts and subtexts. The designs of Norman Bel Geddes are provocative and give both the impression and sensation of science fiction. It is clear from the evidence that the designs of Bel Geddes and other industrial designers, as well as science fiction imagery

associated with cartoons and the cinema, have had an impact on both industrial design and architecture.

For a variety of reasons I discussed in Chapter 5, the work of Luigi Colani, Harald Belker, Harley Earl, H.R. Giger, and Lazlo Maholy-Nagy are part of the cause and effect cycle, although their impact is less pronounced. Other areas that show elements of cause and effect and could be investigated in further research projects include science fiction television, design competitions, and electronic gaming.

I conclude that this aspect of the hypothesis has been clearly demonstrated by the findings.

7.2.4 Science Fiction Cinema

Science fiction cinema performs a key function in the role of science fiction, and can be employed to explore and discuss the roles of industrial design and science fiction.

Science fiction cinema is a critical element in this thesis, owing to its visibility as a science fiction medium, its impact on contemporary culture, and its role in the instigation of this study. The previous section discussed my contention that science fiction cinema is part of a cause and effect cycle involving industrial design and science fiction.

My analysis of science fiction cinema in terms of its industrial design content identified several design issues that examine and discuss how industrial design is employed by the production team of a movie. These themes demonstrate six issues:

- The production design content of science fiction cinema reflects design issues in the real world at the time the movie was made.
- The production team uses the industrial design content in a movie as a tool to support the narrative.
- The narrative subtexts in a range of movies can be used to categorise the production design content in terms of intent. I proposed three themes,

each with three sub-themes, which can be used to categorise the production design *intent* of specific movies.

- Special effect technologies have an impact of the nature of the design elements that can be shown on screen.
- The concept of 'framework', which recognises many layers of context in the fictional world of the narrative, and constructs a network of technologies and cultural issues that impacts on the production design, is useful to both the analysis and creation of industrial design content.
- The development of digital special effects technologies may highlight the need for a well-defined framework for a specific movie.

These results further demonstrate the importance of science fiction cinema to both science fiction and industrial design.

7.2.6 Significance of the study

Through the ideas of anticipation and interrogation, industrial design is both challenged and enhanced by science fiction.

Science fiction challenges the design profession to produce better designs by requiring that the social, political, and technological contexts that products will exist in are explicitly understood and addressed. This is both anticipation and interrogation: the use of science fiction processes as a design tool.

Science fiction, and particularly science fiction cinema, enhances industrial design by allowing designers to create complex scenarios that can evaluate the success or otherwise of design processes and products. Evaluation processes of this nature are typically too drawn out in real life to provide much perspective on the success of the design. This is also a form of anticipation and interrogation.

Lastly, and in a way that has little to do with either anticipation or interrogation, designing for science fiction allows designers to practise in a way that encapsulates many of the challenges and desires of the design profession.

7.3 *Review of Research Methods*

As described in Chapter 2, the research methods for this study were selected to respond to the breadth of ideas in the central and supplementary study questions. In practice, the mixture of qualitative and quantitative methods described in Section 2.2.2 generated both breadth and depth of information, particularly in the analysis of the case studies.

Apart from the literature review, the major research method used in this study was the use of case studies to explore the reality of the hypotheses. As mentioned in Section 2.4, one of the strengths of case studies is that they are able to deal with a variety of evidence. The wide range of evidence assembled for the case studies underlines the relevance of the study, and in my view the case study methods were an appropriate tool to deal with this range of material.

The case studies also helped to extend the model developed through Chapter 5: Industrial Design and Science Fiction.

A number of analytical tools were proposed in Section 2.3.2. Generally, these tools delivered the information that was sought. The distinction between intention / perception was useful in the discussions of the development of both industrial design and science fiction, and the recognition of stereotypes and analysis of definitions also provided information that enabled a deeper understanding of both areas.

The 'impression/ sensation' approach to understanding aspects of both industrial design and science fiction was useful, particularly when looking for areas of cause and effect.

The development of graphic models to chart complex relationships was a valuable analytical tool. The development of the graphic model developed in Chapter 5: Industrial Design and Science Fiction was a key stage in the formation of the study, a key tool in the analysis of the ideas, and a unique

output of this study. The diagrammatic model shows the complexity of the relationship in way that is difficult to achieve in any other way. The diagrammatical approach was employed at other points in the thesis, but could have been used more widely in the analytical chapters 3: Industrial Design and 4: Science Fiction.

The analysis of the intent behind the production design content of specific science fiction movies was described using a taxonomy of design intents. This is another unique output of this study.

7.4 How could this emerging theory stimulate further research?

7.4.1 Science Fiction Thinking

Science fiction in design education

While the use of explicit science fiction ideas in industrial design education is unlikely to appeal to every student, the exploration of forecasting methods based on science fiction ideas may be valuable as it draws together the themes in the roles of industrial design and science fiction. This is an example of how the results of this study could inform industrial design.

- Example - *Ellipsis*: An ellipsis is the three full stops at the end of a sentence, where their presence implies things yet to come or understood in the light of their context ... I propose an *Ellipsis* as an event similar to a focus group, but with the intention of exploring possible design futures (things yet to come) and their relevance to the people attending the event. Possible futures could be mapped out based on existing and potential technologies, and products developed which respond to these technologies and ideas. The participants would be drawn from professional or undergraduate industrial designers, and design methods would be used to explore and manipulate the ideas. This taps into the Make/Say/Do design research model noted in Section 3.4.2.

7.4.2 Cause and Effect

Industrial design and science fiction illustration

This topic would be relatively straightforward to explore. A thematic analysis of science fiction illustration is likely to identify many areas where industrial design and illustration cross over. Possibly of more interest would be an approach that explores contemporary science fiction illustration and the design ideas portrayed in the body of work, particularly the intuitive, framework-based approach to the design of the entire image evident in the work of Syd Mead. This particular topic could be of relevance to industrial design education, and could also have an impact on design for science fiction cinema.

Industrial designers who read science fiction

This study has demonstrated a link between industrial designers and science fiction cinema. However, as noted in Section 1.6.2, the whole study was started by an observation that a high proportion of a particular group of industrial design students read science fiction. This particular aspect of the topic has not been addressed in this study. Exploring this issue is likely to involve a large sample of industrial designers, surveyed using both quantitative (how many?) and qualitative (what does it mean?) methods.

Industrial designers who grew up with Thunderbirds

Gerry Anderson's *Thunderbirds* children's television programme of the mid 1960s was a hardware-rich television series that attracted the attention of at least one budding industrial designer – me. Given the small number of programmes on television in the 1960s, it is possible that many children were interested in the *Thunderbirds* series, not just budding industrial designers. A purely quantitative study could question if incipient industrial designers were any more or less interested in *Thunderbirds* than other children. A more balanced approach would be to ask what these programmes meant to industrial designers or non-industrial designers. This particular topic is only of historical interest, but may generate interest in the wider topic.

7.4.3 Science Fiction Cinema

Exploration of design themes in science fiction cinema

In Section 6.6, I identified six themes in the production design content of science fiction cinema. These are not the only themes that could be proposed. At least two other themes could be explored, although they are more tightly focussed than the themes I have already discussed.

- Design for aliens: what are the design issues for alien technologies? How different will they be from those that have developed on this planet? Why do aliens never wear clothes?
- Furniture: furniture in science fiction movies is often leakage. Why is this?

Industrial design and special effect technologies

In Section 6.6 Science Fiction Cinema, the issue of the relationship between production design and special effects technologies was discussed. It was also noted that developments in digital special effect technologies means that designers and special effects contractors are less limited by the technology and limited only by the imagination of the production design team. Does this make the concept of framework more important, as I have suggested, or are there other impacts that have yet to be expressed? This topic could be explored through interviews with production designers and special effects people, and supplemented by analysis of movies in production. This is a topic that is rich in relevance for industrial designers and the movie-making industry, and made more relevant for the industrial design profession in New Zealand by the presence of *Weta Digital's* special effects business.

Testing the concept of framework

The idea of framework was detailed in Section 6.6 Science Fiction Cinema. Questions that could be asked about the concept include its relevance, application to industrial design, and its application as a tool for science fiction cinema. This could be achieved by a combination of interviews and analysis of movies. Other possibilities for exploring the topic include working on the production design of a specific movie production (which is my personal ambition), and the use of the Ellipsis method (as described on the page 219) for investigating and designing frameworks and contexts.

7.5 Reflection

7.5.1 What did I learn about the topic?

In general, most of what I learned about the topic is encapsulated in this thesis. Despite the drawn-out nature of this study, the topic is still an area of strong personal interest. In fact, the industrial design / science fiction relationship is of more interest now, as I better understand what attracted me to both areas and why the topic is relevant to individual industrial designers and to the profession generally. Far from this being a topic of minor interest to a few people, my investigations have shown clearly that I am not the only industrial designer who is interested in science fiction and science fiction cinema.

7.5.2 What did I learn about design research?

Though the writing of the thesis itself, I have become more confident about the research processes that were employed. I was as interested in the breadth of the topic as the depth of understanding, and the nature of the subject suggested an approach focussed on design research (rather than driven by research methodologies that are of less interest to industrial design). I feel that this approach has been borne out by the results of the study, which have created a body of theory relevant to both industrial design and science fiction where none could be uncovered through the literature review.

I have also become more confident about the relevance of my own observations: in my naiveté as a neophyte design researcher, I felt that it was a *given* that my own observations and opinions as an individual, based as they are on my own experience, were of little relevance. The use of the case study and qualitative research methods demonstrated that my experiences have some application within the study.

As I have commented at several points in the thesis, the literature review for the study was an unexpectedly difficult exercise as there were no precedents to base my explorations on. As someone new to research at this level, it took

me some time to realise that if there was no body of work to review than I would have to fabricate my own approach to the topic.

There were several key points in the study that saw the topic expand or change shape. The diagramming of the issues in the study (the model that was developed through Chapter 5: Industrial Design and Science Fiction) was one of those key points. This was where I realised that design is not only an outcome but can also be used as a research tool.

7.5.3 Limitations of the study

One result of the lack of precedents and existing theory in the literature review was that the formal review of what did exist did not occur until very late in the study, and has only been completed as the thesis was being assembled. This created a serious impediment to the progression of the study that could not have been anticipated.

I would liked to have included a bigger survey that explored how many industrial designers are interested in science fiction as a genre (rather than as a movie genre as discussed in the Chapter 6). As this is a complex process to undertake and to ensure that the results are meaningful, it was omitted from the study as the topic broadened in its middle phase. This survey could form a useful part of a future research project.

7.6 *Summary*

The four aspects of the hypothesis have been supported by the outline of a theory that describes the relationship between industrial design and science fiction. The central study questions were addressed through the definition and discussion of industrial design, science fiction, and the relationship between the two. The study has demonstrated that the topic has relevance to industrial design through the ideas of prediction and interrogation.

The supplementary study questions were addressed through the connection of industrial design and science fiction, and in the analysis of the case studies. The research methods generally delivered the information that was expected, and there are a number of ideas on which further work can be based. Much has been learned about research processes through the progression of this study, particularly about the connection of design and research.

On reflection, the study remains of strong personal interest.

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Newman, J. (director). (1955). *This island earth* [Motion picture]. United States: Universal, Newman.

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Radford, M. (director). (1984). *1984* [Motion picture]. United States: Umbrella-Rosenblum/Vergin Cinema Films.

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Roddenberry, G. (Creator), Daniels, M., McEveety, V. & Oswald, G. (directors), (1966- 9). *Star trek* [Television series]. United States: Paramount Television/NBC.

Sagal, B. (director). (1971). *The omega man* [Motion picture]. United States: Warner Bros.

Siegal, D. (director). Wanger, W. (producer). (1956). *Invasion of the body snatchers* [Motion picture]. United States: Allied Artists.

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Scott, R. (director). (2000). *Gladiator* [Motion picture]. United States: Dreamworks & Universal Studios.

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Vadim, R. (director). (1968). *Barbarella* [Motion picture]. United States: De Laurentis/Paramount.

Verhoeven, P. (director). (1987). *Robocop* [Motion picture]. United States: Orion.

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Wilcox, F. (director). (1956). *Forbidden planet* [Motion picture]. United States: MGM.

Wise, R. (director). Roddenberry, G (producer). (1979). *Star trek: The motion picture* [Motion picture]. United States: Paramount.

Young, T. (director). (1962). *Dr. No* [Motion picture]. United States: Econ/United Artists.

Zemeckis, R. (director). Spielberg, S. (producer). (1985). *Back to the future* [Motion picture]. United States: Amblin Entertainment/Universal.

Zemeckis, R. (director). Spielberg, S. (producer). (1989). *Back to the future part 2* [Motion picture]. United States: Amblin Entertainment/Universal.



Appendices

Bruce Sterling, *personal communication (email)*. Nov 29, 2005

Syd Mead, *personal communication (email)*. Dec 9, 2005

Core77 discussion, *Design on Film*. Retrieved June 16, 2006, from <http://www.core77.com/chit-chat/film.html>

From: Bruce Sterling <bruces@well.com>
Subject: Re: SF and design
Date: November 29, 2005 4:28:28 PM GMT+13:00
To: Lyn Garrett <L.K.Garrett@massey.ac.nz>

*Well, yeah. Your topic is mighty interesting, but I've been very busy teaching designers over here. There's scarcely a spare hour in the day.w's

*How's January looking for you and yours?

Bruce Sterling

On Nov 28, 2005, at 3:28 PM, Lyn Garrett wrote:

Hi Bruce:

I emailed the following text to you a few weeks ago - I haven't had any reply, which I assume means that either you're very busy, you're not particularly interested, or you've put the message on the back burner until you have time. On the theory that it's the latter, I thought I'd resend the text. If I don't hear anything, I won't bother you again!

Cheers
Lyn

Lyn Garrett
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M: +64 27 286.3201
E: L.K.Garrett@massey.ac.nz

Hi Bruce:

I've no idea if you get piles of unsolicited emails from science fiction people: if you do, maybe this email is a bit different.

I'm an industrial designer who is interested in science fiction. Over the last four years, I've been slowly assembling a Masters thesis that explores the connections between science fiction and industrial design, based firstly on my specific interest in production design for science fiction movies, and then more broadly on the conceptual relationship between the two areas. My research was prompted by an observation by a colleague that he felt that industrial designers were more interested in science fiction than most professional groups, and from there I've arrived at a point where I have generated a 'model' of the parallels, overlaps and synergies between science fiction and industrial design. I'm particularly interested in the processes that both SF and ID use to generate and give form to ideas, and along with production design, I have a side interest in science fiction and design history.

Until recently, I've struggled to find much writing or opinion that connects the two areas. There is a lot of stuff out there that glorifies the production design for specific movies, for example, but very little about what the relationship between SF and ID might actually mean, and why it might be important. I'm interested in the work of Syd Mead for example, and I am also aware of a body of writing about Futurism. However, I only recently came across your online article 'What's a science fiction writer doing hanging out with designers anyway?' that is posted on the wiredblogs.tripod.com website, and I'm thrilled to see that there is at least one other person out there who has arrived at more or less the same place as I have - even if the journey has been by quite a different route.

Like you, I had also arrived at Norman Bel Geddes and his conceptual work, and also at the 1939 World Trade Fair, where not only Bel Geddes but also Loewy and Dreyfuss were pedalling industrial design. I had also arrived at the Sublime, but for slightly different reasons - partly because it's evident in science fiction movies, sometime through the production design (my observations were based on an article by Scott Bukatman in 'Alien Zone II', edited by Annette Kuhn) and partly because I see it in the illustrative work of Syd Mead (an industrial design student favourite). Certainly, the ideas that you're exploring through Viridian are another area that I've arrived at, based on the observation that designers tend to be more interested in the short-term future rather than the longer term, and that science fiction methods might have something to offer industrial design.

As a lecturer in industrial design, I have had some opportunity to air my research within the academic arena of the College where I work, as well as hearing what the industrial design students think of the whole thing. There is a consistent vein of interest in science fiction and particularly science fiction movies among our students, and one of the potential gems that I see is the possibility of using science fiction - either explicitly or (far more likely) implicitly - in industrial design training.

Anyway, there are a number of reasons I was interested in contacting you in the first place. One is that - if you'd be interested and able - I'd love to have your opinions on the design / science fiction issue, particularly on how the two areas might be related and what the

potential is to enrich one with the other. I'd also like to run my 'model' past you for your opinion – something that would add weight to my research as I tie up my thesis. I'd also be interested in hearing if you're aware of anyone else who is seriously interested in both science fiction and design (from either side of the tracks). Lastly, given the sorts of things that I've read in your articles, I suspect that I could contribute something to what you're doing, but that might be presumptuous of me.

I imagine that you're a busy person and that time is precious, but if you have any response at all I'd be really interested in hearing from you.

Cheers and thanks

Lyn

From: Syd Mead <oblagon@worldnet.att.net>
Subject: Re: NEW ZEALAND DEAL
Date: December 9, 2005 4:22:48 PM GMT+13:00
To: Lyn Garrett <L.K.Garrett@massey.ac.nz>

I checked out your animated chart. I liked the graphical organization very much. Critically, I'm a bit suspicious of charts, but given that comment, my impression was this;

The link between 'science fiction' and 'industrial design' demands that those two areas are sufficiently defined so as to allow comparison in the first place. Yes, both employ artifact as illustration of story. I have made the comment before when asked that for me, there is no difference whatsoever in how I design for science fiction or how I go about designing for a 'real world' product, or a theme park, or an airplane interior, or a super yacht or...I think of it all as 'story' and then simply (not that simple, really, but as an aphorism) proceed step by step to 'solve' the problem. The fact that my design is used as a prop in a science fiction movie, or as a daily artifact in somebody's daily routine does not matter to me at all. It's all part of a 'story.' The largest single flaw, for me, in cheesy 'sci-fi' is the unlinking of story and believable artifact. If the cars can fly, why does the 'hero's' car NOT fly when a crisis arrives? To selectively violate a story premise for the convenience of plot is, to me, the biggest block in movie formats. Anyway, I hope all of this helps.

A trip to the bottom of the globe? Sounds fascinating. Here's the way we usually set it up. Roger Servick, business manager for both Syd Mead, Inc. and our publishing company, OBLAGON, inc. would create an agreement proposal which would include having books available at the point of presentation. I would sign them on the spot. Time to 'relax?' Well, meeting youngsters is such a rush...that age group that is transiting from adolescent to adult...a fabulous stage that is an inspiration to both enjoy and augment. Neither of us is all that athletic; christ! I'm 72 and Roger is 57. No, we don't bungee, ski, swim, like that. Life is exciting enough, really.

So, we appreciate your invitation and given time and money, anything is possible. I send best season's wishes, and hope all of this helps

SYD MEAD

Syd Mead and Science Fiction

What do you get out of science fiction personally?

Type in this column – the formatting should sort itself out.

I really don't think of what I do as a specific idea destination. What I 'think' about is that whatever world format becomes the basis of the 'fiction, (the science in 'science fiction' can be predictive...ie, technical expertise catches up with the theoretical idea) that world needs all the stuff that the present has to create scenario. I appreciate the pretense of what 'that world's' technical proposal happens to be and then design to match the logic of the pretense. My process in creating imagery and 'design' for a science fiction conceit is exactly the same as for 'real' industrial design.

Has your interest in science fiction affected how you think as a designer, and/or the way that you design? If so, how?

Review the above question and answer. In short, no

You describe yourself as essentially optimistic about the future and about the role of technology in that future. Can you describe the difference in your designs and / or design work that project this optimism?

Optimism is an exercise in appreciating what the human mind can create and implement. We have, in the world today, more minds figuring out problems that face our civilization than has ever existed in history. We humans have the ability to invent. Our inventions are often both fulfillment and threat. Technology is morally neutral. Remember the mythology of the 'tree of good and evil.' Our minds can rationalize; our cogent abilities are a mixed blessing; my opinion is that to misuse our intelligence is an insult to our very existence as a species. There will always be misery, chicanery and assault; I have not enough time to celebrate anything other than the triumph of human intelligence.

Syd Mead as a Visual Futurist

What feedback have you had from designers about the influence / significance of your book *Sentinel*? What are your own feelings about the influence of this book?

Sentinel was the first one, edited by Roger and Martin Dean in London. The book had a lot of artwork that I had done for United States Steel as an account job. John Reinhart 'rescued' that art from the furnaces, Roger and Martin came along and put the artwork into a book, along with some other stuff that I had. That book in turn generated world-wide visibility as adjunct to the U.S. Steel series that had been published in the early to middle sixties. I get a lot of comments now from guys whose FATHERS got the book, showed it to their sons and then...I feel enormously proud and humble at once. My fan base now extends down to the second generation of the first readers of those books!

What feedback have you had from designers about the influence / significance of your book *Sentury*? Has it been any different from *Sentinel*? If so, why?

I can't really say...Sentury has been in circulation for four years, but I will tell you that whenever Roger and I have a presentation and the book is for sale, we sell out. All of the movie studios have the book on their reference shelves, as well as university and college libraries.

Your collaboration with Ridley Scott for *Blade Runner* is still talked about for the quality of its design vision. Why do you think the movie remains influential in design terms, even 23 years after the release of the movie?

BLADERUNNER...first of all, Ridley is one of the top visualizing directors, and consistently won awards for his television commercial spots. He is the master of the tight shot and is very sensitive to frame-by-frame composition. BLADERUNNER has a level of detail consistency that I was fortunate enough to visualize. The movie never violates its basic rationale,

I have seen *Blade Runner* mentioned as the reason that some people chose Industrial Design as a profession (for example, in this discussion thread <http://www.core77.com/chit-chat/film.html>). Have you an opinion on why this is? Are you personally aware of anyone who has been influenced in this way?

either technologically or in terms of scenario continuity. (The director's cut, not the dumb initial theatrical release.) It is really a love story with a twist. It has been compared to METROPOLIS because of the thematic rationale of the 'disposable' worker. It addresses, in subtle yet compelling format the question: what constitutes intelligence, and given an answer to that, how 'smart' does a device have to be before it becomes a morally valid entity? That question will come up in very viril terms within the next ten years as automata become life-like and 'intelligent' as a functional, autonomous entity. BLADERUNNER is intently and disturbingly prescient. So, I read through the thread; BLADERUNNER, TRON, 2010, ALIENS and STRANGE DAYS were all mentioned, and I worked on all of them. I am extremely lucky in having been involved in mostly 'signature' films. All of those films employed technologically advanced artefacts to illustrate the story line. I used my industrial design rational and methodology which lends that curious sense of appropriateness to the visual image. If anyone appreciates that kind of attention to representation, they already have an affinity for solving design problems.

Industrial Design and Science Fiction

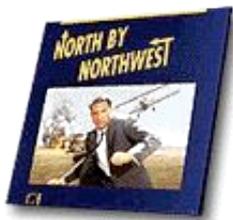
My anecdotal impression (as yet unproved, but part of my study) is that there are many industrial designers interested in science fiction.

Do you think that industrial designers are any more or less interested in science fiction than any other professional group? Do you feel that industrial designers SHOULD be any more or less interested in science fiction than other professional groups? If so, why?

I would say 'yes' without any particular proof, but anyone trained to appreciate proportion, suitability, morphology will have an appreciation when those qualities are obviously dramatized as story artefacts, especially when the design projects a robust presence. I would think that industrial designers would be more interested in science fiction than other professions because it IS about design; the visible result of solving an elaborate combination of morphology, function and unique appearance. The second most appreciative profession would be architects; not the 'run of the mill' crowd, but the creative architects who push their particular envelope of imagination coupled with technical feasibility

Would you see any value in science fiction processes or ideas being used in training industrial designers work, even in a way that is implicit rather than explicit?

Nature substitutes endless time for short term process. In the very truest terms, nature is the ultimate designer. We are at the very small edge of the wedge in unravelling nature's techniques and beginning to learn how to manipulate nature's elements to custom design our own versions of 'natural' processes which will make meaningless the distinction between 'natural' and 'man-made.' My point to this ramble is that nature is an incredible teacher; to be a successful industrial designer...DESIGNER as a generic pursuit, one must hone the ability to notice, to remember and to implement. You would thus coax a personal sensitivity to the fore and retain a resident respect for process, for appropriateness, for that delicate balance between unique and familiar.



design *on film*

Simple question:

What is the greatest ID film of all time, and why?

Is it because it stars a designer (or a spy pretending to be a designer), or because the set designs are great, or because the settings are full of great design? If you can't think of an answer to this question, then why has design been all but ignored in most mass media? **Let us know!**

CLICK! ADD A COMMENT CLICK!

Weeeell, I'm an Industrial Design student, and I love Sid Mead's work on Blade Runner, but I'm also a Star Wars fanatic, so I suppose the first prize goes to the trilogy.

Filipe Alves -

I say Bladerunner is the best - I think it's a movie that inspired many to become designers. Gattaca was also pretty good.

Konrad Solarewicz - <[konsolar < a t > hotmail.com](mailto:konsolar@t@hotmail.com)> - San Francisco

Fifth element would be my pick. Did you see how the secretary made her manicure?

Aylo - Boston , MA

Check out "Auntie Mame" the title character re-does her apartment every year and it's always outrageous. Another great film for quirky Hollywood movie stuff is "Paris When It Sizzles" with Audrey Hepburn. Tony Curtis plays a beatnik, it's very much a 1940's studio film

Emily Vassos - <[evassos < a t > hotmail.com](mailto:evassos@t@hotmail.com)> - california

"La Dolce Vita" (Fellini)

I've never seen a film more sublime in it's visual expretion. It is always on the cutting edge betwen decadency and subtl deffenition of god taste. Never have Black & White been so stylish.

"Play Time" (Tati)

The audience thought it wehere just filmed on location, only because they made a perfect copy of the "Charles de Gaule" air port in Paris. When you´re abel to make a futuristic look ,(You still get that feeling when you see it to day)that could have been used in a "Dogma" film ,and at the same time are critisising modernety as a consept, It is a masterpice.

Johannes Book Mohn - <[johannesm < a t > ssff.filmenshus.no](mailto:johannesm@ssff.filmenshus.no)> -

Brazil - The best, considering the technological resources due to that time
Bladed Runner & 2001

vero - Argentina

Brasil - The best, considering the technological resources due to that time

vero -

The designs of ships, sets, and characters for Star Wars are superb. Twenty years later they stil do not look dated and helped capture the imagination of so many people. A sign of top design.

Barry Gingell - <[b.r.gingell < a t > herts.ac.uk](mailto:b.r.gingell@herts.ac.uk)> -
hertfordshire, England

Well DUH! The best ID film ever (beside the best film ever made) is Blade Runner.

Anthono Cardott - <[Pneumadore < a t > hotmail.com](mailto:Pneumadore@hotmail.com)> -
Aromas, California

No one has mentioned Modern Times the first Charlie Chaplin talkie. Man against machine!

Also, If you can loacte it Buster Keaton's One Week is alot of fun. Plus Charkes + Ray Eames made many other fims about design other than the famous Power of ten.

Don't forget their are alot of good doco's about design, especially those from the BBC and C4.

Miles Park - <[miles.park < a t > unsw.edu.au](mailto:miles.park@unsw.edu.au)> - Australia

If you can find it, check out "The Tenth Victim," an Italian production (c.1965) that gives several tastes of futuristic fashion, furniture and architecture. Fun to watch, too.

RCMARK - <[bobmark < a t > compuserve.com](mailto:bobmark@compuserve.com)> -

What about "Men in Black"? (w/ Will Smith and Tommy Lee Jones). It seems to have been inspired by E. Saarinen's designs... And Scorsese's "Snake Eyes" with the conference room scene using Herman Miller's Aeron chairs....

Winter Lain - <[terwints < a t > hotmail.com](mailto:terwints@hotmail.com)> - Manila, Philippines

Besides the obvious "Bladerunner" the "Alien", "Star Wars", and James Bond series', Gattaca, and anything from Terry Gilliam. I would like to add "Logan's Run", "Raiders of the Lost Ark" "Sleeper" and "The Planet of the Apes"-Movies I II and IV, . Also there are some interesting gynecological instruments in "Dead Ringers."

But for some odd reason I also get inspired to design by watching the following:

"Sunset Blvd."
 "Vertigo"
 "Notorious"
 "Cat People"(1942)-there might be designers in it
 "Laura"
 "The Graduate" ("...plastics...")
 "Bell, Book and Candle"
 "The Phantom Lady"
 "Rear Window"
 "The Trouble with Harry"
 "Gilda"
 "The Lady from Shanghai"
 "Touch of Evil"

TC - Washington

3 movies:

North by Northwest - thanks to Alfred H., the only time I've heard the phrase 'I'm an Industrial Designer' in a film. Superb film.

Brotherly Love - well-done, but older TV crime flick starring Judd Hirsh. He was a brutally murderous Industrial Designer. I forget the plot. Did anyone else see it?

Demolition Man, a silly film, starring Syl Stallone and Wesly Snipes. Easily rememberable because of Eric Chan's (ECCO, NYC) design contributions in props and design.

J Keen -

What about The Crow? I thought the set design on that was fantastic.

How about Natural Born Killers? Fear and Loathing in Las Vegas?

12 Monkeys? The Quick and the Dead?

Barton Fink? Romeo & Juliet?

C'mon people the possibilities are endless. I agree with most of you on Alien, Dune, 2001, Blade Runner etc. but try to look past the obvious choices and really see what is out there.

Frank - <[keyser-soze < a t > webtv.net](mailto:keyser-soze@a_t_webtv.net)> - Clifton NJ

Definitely "Metropolis" for mechanics, and I believe it's titled "Follies of 1939", but the Busby Berkley musicals were interesting in that he used humans to construct moving shapes to go with beautiful Art Deco sets.

"A Summer Place" for juxtaposition of nice victorian home and awesome seaside F.L. Wright home.

Clockwork Orange, 2001, Dr. No (Q is definitely the man, and I have been lucky enough to do some similar work for our boys in black, so I appreciate the diversity and clever nature of his designs) Dune, Blade Runner, Star Wars yes, but Fifth Element is the best overall in my sordid opinion for punchy design of costumes and sets and the actors themselves are strategically different looking. Love Milla's hair color!

K. Frank - <[ragnarok8 < a t > earthlink.net](mailto:ragnarok8@a_t_earthlink.net)> - San Marino, CA USA

The two best designed movies are "Blade Runner" and "Batman" by Anton Furst. He won an Oscar for it.

Myles Mc Swiney - <[mylesmcs < a t > hotmail.com](mailto:mylesmcs@a_t_hotmail.com)> - Berlin, Germany.

The latest "design"film to catch my eye is "Gataca". From machines that access the ultimate form of identification, the starkness and rich mixture with architecture, the workplace, and one possible future are alluring and haunting. The art of this film is, I think, on par with "2001". "The Hudsucker Proxy" is at the other end of the fun spectrum.

Steve Petrushka - <Steve-Michelle.Petrushka> - Concord,

CA

The latest "design" film to catch my eye is "Gataca". From machines that access the ultimate form of identification, the starkness and rich mixture with architecture, the workplace, and one possible future are alluring and haunting. The art of this film is, I think, on par with "2001". "The Hudsucker Proxy" is at the other end of the fun spectrum.

Steve Petrushka - <Steve-Michelle.Petrushka> - Concord, CA

Very interesting conversation. For an industrial designer, now studing Vehicle Design at the Royal College of Art in London, this page is really a source of inspiration... congratulations to the founder.

Next year I'm in my final year and I would like to dedicate my final project to a future film. This means that I would like to design a car for a sci-fi film that is in its early stages. If somebody can give me a name of a contact person, or any other suggestions, please feel free to e-mail me

Thanks, Bregt

Bregt Ectors - <b.ectors@rca.ac.uk> -

Gremlins - remember that electric toothbrush and the crazy "egg machine"!

Big - all those cool toys...

The Simpsons episode in which Homer gets a toy bird to type "Y" on his computer.

The Fifth Element - which I prefer over Brasil - largely because of Milla Jovovich!

Any of the "007" flicks - Q rules.

Slavko - <eror@idirect.com> - Toronto

kiko mask is by far the best film ever created!

steve - <[vent7 < a t > prodigy.net](#)> - cleveland

I would like to cite Carroll Ballards film: Wind, starring Matthew Modine and Jennifer Grey. The story is in the tradition of applying the classic design,(a sailboat), to a competition , (The Americas Cup), loosely based upon Dennis Connors Team USA. The film explores taking a concept and developing it through scientific principals and the design process and creating a prototype boat and sail. Don't miss this movie. I think that Ballard is one of the top Cinematographers and directors in the business. Some of his other works are, The Black Stallion, and Fly Away Home. I also agree, that Francis Ford Coppola's Tucker: A Man and His Dream starring Jeff Bridges is also a great Design film. Let me know what you think.

Dave Mitchell - <[mitchell5 < a t > wit.edu](#)> - Boston, MA

I challenge anyone to watch the long-cut of Dune, watching anything but actors, to tell me that movie isn't one of the top 5 movies for ID.

Billy D Arnold - <[horus heresy < a t > yahoo.com](#)> - San Fransisco

THX 1138

For its lack of industrial designed products. It was about a guy named THX 1138 (Robert Duvall) discovering and fighting for his humanity. The environment was stark and oppresive. It reflects how life can continue without design but it is a lot cooler having this designy stuff around. This is very similar to Brazil that has frankensteiny anti-design products that make your life more difficult.

RAUL MUNOZ - CHICAGO

Hey what about the tin man, The Emerald City, Oz, come on now old oz was'nt an alchamist but he built a set I have not forgot.
David

David - <[form < a t > net-link.net](#)> - mich.

Hasn't anyone seen "The Hudsucker Proxy"? The whole movie is based on simplicity in design. It's the purist's dream flick.

Mike - <[NyKerv < a t > aol.com](mailto:NyKerv@aol.com)> - NY,NY

...and what about "the fifth element" ???..

pavel - Prague

Aliens 2 always interested my because I knew that its creator(sorry, can't remember his name) began his career as an industrial designer. I've seen a book of his inspirations for the movie...IT'S VERY TWISTED(makes you wonder how he went from ID to that).

ID4 was interesting because many industrial designers and modelmakers helped create that movie. There's an ID4 cd-rom that covers the making of the movie with interviews of industrial designers(and modelmakers, special effects experts...), preliminary sketches, story boards, renderings, models, clips from the movie...For about 20\$ its worth checking out.

Your Friendly Neighborhood Designer - Montreal, Canada

anyone notice the nifty desgins in the George Michal video?

Oisin O' M - <[9731105 < a t > student.ul.ie](mailto:9731105@student.ul.ie)> - Ireland

2001:a space odyssey. you probably don't need to ask why.

timothy hanson - <[thanson < a t > aw.sgi.com](mailto:thanson@aw.sgi.com)> - toronto

I would have to say StarWars for getting me into ID in the first place. From there, I got into other sci-fi like BladeRunner (just 'cause it's such an awesome story) and lots'n'lots of anime. Those Japanese have some really WILD designs going on. Re: Macross, Patlabor2, Ghost in the Shell etc. Not traditional ID stuff that is shoved down our throat at school, but definitely fun and imaginative.

Adrian van der Park - <[adrianvanderpark < a t > acc.ocad.on.ca](mailto:adrianvanderpark@acc.ocad.on.ca)> - Ontario College of Art + Design

My nominations are:

Strange Days (everywhere you look, HDTV sets!)
Wind (designing sailboats in an old desert hangar)

and anything Japanimation.

Oh. And you can't leave out the original 'Alien' for sheer vision.

Brian Pettett - <[bpett < a t > mcs.net](mailto:bpett@mcs.net)> - Chi-town

There are only two movies which deserve that title: Stanley Kubrick's "2001: A Space Odyssey" and Terry Gilliam's "Brazil". I can't make up my mind between the two... Maybe "Brazil". It's a masterpiece, it's what movies are all about. It's a pure work of art, a work of a genius.

Alex Zambelli - <[azambell < a t > public.srce.hr](mailto:azambell@public.srce.hr)> - Croatia

I think one of the best-designed films of all time has to be Tron. This movie did a far better take on the "people journeying into a computer" theme than many since have. The wierd barren computer-grid landscapes, the ship at the end, the glowing costumes, everything is treated in a more personal way than the big CGI effects of today. The designs of this film may not be the most extravagant, but they certainly are among the most effective.

Ulf Schlender - <[Schlenderu < a t > alpha.montclair.edu](mailto:Schlenderu@alpha.montclair.edu)> -

MY ALL TIME FAVORITE ID MOVIE IS STANLEY KUBRICKS

2001: A SPACE ODYSSEY. THIS MOVIE IS AN INDUSTRIAL DESIGN HEAD TRIP, REALLY. ALSO, HONORABLE MENTION SHOULD GO TO GERRY ANDERSON'S "JOURNEY TO THE FAR SIDE OF THE SUN", THIS MOVIE HAS COOL CARS, COOL (REALISTIC)SPACE VEHICLES, AND COOL FASHIONS TO BOOT. QUITE ACTUALLY, ALL OF GERRY ANDERSONS PRODUCTIONS ARE FAB. - STINGRAY, THUNDERBIRDS, CAPT. SCARLET, AND ESP. UFO AND SPACE:1999. ALL ID PEOPLE SHOULD BE AWARE OF THIS.

Cary - <[Quelller drive < a t > hotmail.com](mailto:Quelller_drive@hotmail.com)> - NJ

APOLLO 13

A recent film which struck me as a epochal film in the industrial design genre.

Not particularly for it's sets (which are moderately impressive). Nor its actors, who play astronauts not designers.

There is one scene in the film which clinched it for me... when they needed to connect the oxygen(?) line from the lunar module to the cockpit. The staff in Houston had to "fit a square air filter into a round housing" (and a bag of parts were spilled out onto a table. As an isolated scene it is charming to designers and engineers- but also to anyone who has grappled with such a problem. Put the scene into context and you have an incredible scenario; the most ambitious design project yet known to man, dedicated teamwork, human ingenuity, an astronaut's dreams slipping away, a life or death situation, a nation/world watching... and it really happened!!!

Ken Kirkland - <[lekirk < a t > concentric.net](http://lekirk.com)> -

Congratulations on surfacing film design as an issue for debate. If anyone is interested in a serious discussion, debate, and or a course in Production Design I would be interested in your comments.

A Production Designer doing research...UCLA Extension Program participant.

John DeCuir - <[cinemat < a t > ix.netcom.com](http://cinematix.netcom.com)> - LA

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John DeCuir - <[cinemat < a t > ix.netcom.com](http://cinematix.netcom.com)> - LA

I m a sci fi fan and loved all types of futuristic movies but the one you all should see are those japanimation using computers to assist the artists in their awesome work. The best i ve seen are AKIRA ROBOTECH and i m anxious to get my hands on GHOST IN A SHELL

Galil Alex - Montreal Canada

I think the best film it's possibly Alien II. The work of Sid Mead is glorious! Blade Runner is another good film.

I would be very pleased if somebody can tell me where can I find the book of Sid Mead "Steel Couture".

Gabriel Asuar - <[gab < a t > jet.es](mailto:gab@jet.es)> - Guecho, Spain

How about a lesson or two from the "MacGuyver" TV show?

"Design" is defined as intuitive problem solving within criteria (read "reality"). "Art" is for the movies.

Ricky - <[: \]](mailto:ricky@jet.es)> -

My favorite Industrial Design related movies are: "Bladerunner", simply the best; also from Ridley Scott "Alien". Kubrick's "2001" and "A Clockwork Orange" where also 100 percent prospective movies including all sorts of hardware, trends and fashions. Terry Gilliam's "Brazil" and "Baron Munchausen". Wim Wenders fantastic approach to the future of communications in "Until the End of the World", its American "version" (not so edgy) "Strange Days", and don't forget "Brainstorm" (don't know who was its director). Almost all of Federico Fellini's movies have something to do with design. Can't finish without mentioning "Star Wars", the perfect example of how a lousy story can become a great movie. Fritz Lang "Metropolis" and the Lumiere Brother "Voyage to the Moon", Soviet Andrei Tarkovsky(?) "Solaris" are also great examples of how I.D. has made magic out of cinema.

Julian F. Baquero - <[jfbaquero < a t > inter.net.co](mailto:jfbaquero@inter.net.co)> - Universidad Javeriana/Bogotá - Colombia

It may not be the greatest ID film of all time, but Fritz Lang's "Metropolis" 1931, has to be up there. This seems to be a film that was very much ahead of its time, and seemingly has set trends that are still adhered to today.

Hans Hugli - <[hansh < a t > oz.net](mailto:hansh@oz.net)> - Seattle WA

I watched Bladerunner again for the 'n'th time last night and it still looks as fresh and innovative as when it first appeared on film. How many designs is that true of?

Jim Allen - <[j.allen < a t > uclan.ac.co.uk](mailto:j.allen@uclan.ac.co.uk)> - University of

Central Lancashire

Excuse me, the above quote should refer to David Janssen.

Nora Butler - <[butlern < a t > mscd.edu](mailto:butlern@mscd.edu)> - denver

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Nora Butler - <[butlern < a t > mscd.edu](mailto:butlern@mscd.edu)> - denver

Excuse me, the above comment should say "David Janssen."

Nora Butler - <[butlern < a t > mscd.edu](mailto:butlern@mscd.edu)> - Denver

My two cents to this question: I think the main reason I am an i.d. student is due to space and technology-related movies of the mid- to late-'60s, and yes, of course, "2001" is up there, but I remember watching "Marooned" as a little kid at the drive-in and marveling at the cool spacecraft David flew to co-rescue the marooned Americans (the Russians helped). I guess we really owe it all to R. Loewy and his work with Skylab, but I wonder if he had a hand in that movie...

Nora Butler - <[butlern < a t > mscd.edu](mailto:butlern@mscd.edu)> - denver

If you look past the revolting gore and mindless plots, the original "Hellraiser" and "Army of Darkness" rank right up there for classic set design and character innovations.

Jeff Daum - Thomson consumer electronics

Although on the gorey and morbid side, the original "Hellraiser" was quite an astonishing piece of set design and character creativity. Not the top ID film in history though.

JEFF - THOMSON CONSUMER ELECTRONICS

Didn't any of you guys see "TUCKER"? This is the ID movie to see... not because of great model makers, or sets or anything else that is destroyed in the film, but the very heart of the designer, putting his entire self into his work and doing it all for the end customer. Man, if you haven't seen it, rent it and get charged for work (or school) tomorrow!

John Novak - <[novaks < a t > ix.netcom.com](mailto:novaks@ix.netcom.com)> - Hitachi

Home Electronics (Atlanta GA)

Well, I don't know if they are the greatest films of ALL time, but I kind of liked:

DIVA for the feeling that it evoked and the great apartments and stuff

BARBARELLA for the sets and the great spaceships and of course Jane Fondas Bikini's.

DUNE, BLADE RUNNER and THE COOK, THE THIEF, HIS WIFE AND HER LOVER.

Hans Wissner - <hwissner@acs.ucalgary.ca> - Faculty of Environmental Design (ID), University of Calgary

...the greatest is yet to come. Could be the film I am dreaming to create... the one on the great Indian mythological epic - Mahabharata - which tells of the nuclear war between evil & good high-tech civilizations (some 10,000 years B.C ago). Replete with genetically enhanced armies, hyper-spacecrafts, political intrigues.....

nikhil - India

Its OK Now. Chat away

Stu - <stucon@core77.com> - New York

The disign in movies has been allways for filmmakers joust a service from some companies which they don't deserve any credits even though we all designer have the right for credits on our work. Almost everytime I search in the credits of a movie for a set or a interior designer I have to use my glases because the letters are very small !!

I.D. HUMBERTO M. GARCIA ALCOCER - <GALCO@BSMX.COM.MX> - MEXICO CITY

Most of the James Bond movies belong to this category because these were the first series of movies which people liked. This was great entertainment of the time. People also liked to see some romantic, emotional and sexy scenes.

ANJUM JAMAL - <Umar@idirect.com> - Toronto, ON, CANADA

I would have to say that every time I watch the Star Wars movies I marvel at the way every element of the movie is

designed specifically. These movies display an entire world that was designed by its' creators. There are no elements of the set that are left undesigned.

Lucas Oeth - <[oeth0001 < a t > maroon.tc.umn.edu](mailto:oeth0001@maroon.tc.umn.edu)> - University of Minnesota (student)

Yes, "Blade Runner" and "Brazil" ("Batman"'s gothic vision was kewl too). But also most films by Michael Mann, Y'know--the guy who did Miami Vice? His use of color, camera angles, filters, sound and framing turn otherwise mundane or average films into complex, moody works of art that really stand out. His work stands out of the crowd and stands alone. One of his best is "Manhunter" the movie version of the book "Red Dragon". This was the prequel to "The Silence of the Lambs". Really gets one drawn in to the mind of the psychotic killer. If that isn't design (as in evocation of mood based on form and presentation), then I don't know what else could be.

-)

Rob - <[rob < a t > insweb.com](mailto:rob@insweb.com)> - SF, CA

just checking

d - <[d](#)> - d

The late Natalie Wood in her last movie, "Brainstorm", in which she played an Industrial Designer.

This is just a test -

"Mr. Blanding's Builds His Dream House" shows the total scope of a design project and what it's like to work with a client and his wife who has "taste".

Lou Scrima - <[musmDesign < a t > AOL.COM](mailto:musmDesign@aol.com)> - New York City

Blade Runner is the high exalted ruler of the industrial design genre. also brazil, these two films are the visual representation of the heart and soul of what i.d.is all about.

DIEGO WOOD - <[nsdznr < a t > shocking.com](mailto:nsdznr@shocking.com)> - Chico, California

I'd like to mention a little known series of films begun back in 1976. Star Wars... In case you didn't know, there are a series of books on the art of Star Wars. Wonderful! Also,

many Japanese animated films have some phenomenal design, particularly "Akira" and "Ghost In The Shell"

chris mcombs - univ. o' cincinnati

I think the actual title is "Powers of Ten" by the Eames. My teacher showed it to class and it was impressive and amazing. And what about Sal Bass' credit sequences.

Brian McGrath - <[mcgrbri < a t > charlie.cns.iit.edu](mailto:mcgrbri@charlie.cns.iit.edu)> -
www.id.iit.edu/~bmcgrath

Hey guys, just saying hi since I finally got a server that lets me check out your site, which is great! By the way, I'd check out "Spellbound" for great design. Hope all's well -
Cheers -
Eve

eve - <[evelaure < a t > interramp.com](mailto:evelaure@interramp.com)> -

How come nobody mentioned Alien? or Aliens (Alien 3 wasn't as good). Surely these films are the most apparent manifestation of design and belief in the vision of the artist. After all Geiger started out as an Industrial Designer (though he's one of the few who recieved unlimited artistic licence- lucky sod!!)

Shane Mc Allister - <[Shanemca < a t > indigo.ie](mailto:Shanemca@indigo.ie)> - Ireland

The film that needed the most ID skills was "Soylent Green" probably a miss-spelling starring Charlton Heston. "Judge {whatever}" starring Stallone was done better. The BEST was "ROAD WARRIOR"

louis Scrima - <Musmdesign> - NYC

Halle Berry was a graphic designer, slash Illustrator in Eddie Murphy's Boomerang! Yea for designers of color! Otherwise, films have made artists out to be crazed serial killers...

ally - <[athornton < a t > jcs1.jcstate.edu](mailto:athornton@jcs1.jcstate.edu)> - new jersey

The most conspicuous example of product design in movies this summer is Apple's Powerbook. First it assisted Tom Cruise in defeating the pc-using bad guys in "Mission Impossible" and then it saved planet earth in "ID4" when Jeff Goldblum discovered that the spacemen were Mac

based themselves (looks like system 12 or above that they were using.) ---Macintosh: the preferred operating system of secret agents and invading aliens.---

Wrigley -

As far as designed films- I would say Wim Wender's "Until the End of the World" has a realistic vision of near-future technology and design.

Susan Gerber - <[dsznr < a t > shaggy.caac.edu](mailto:dsznr@shaggy.caac.edu)> - Calif.

Mr. Mom was a car designer.

Susan Gerber - <[dsznr < a t > shaggy.caac.edu](mailto:dsznr@shaggy.caac.edu)> - Calif.

In "The Line of Fire" John Malkovich's character is very much an Industrial Designer. Good knowledge of plastics, modelmaking and more than just a little off kilter. Clint even goes to Art Center to get a lead on him.

Jon Farmon - <[jjfarr < a t > teymor.net](mailto:jjfarr@teymor.net)> - Springfield

Eva Marie Saint as an industrial designer in NxNW convinced me that ID was a field of intrigue and action!

eric - <[ludlum < a t > core77.com](mailto:ludlum@core77.com)> -

For me, "2001: A Space Odyssey" still stands as the greatest piece of industrial design seen in a movie. EVERY item in that film (not it's sequel) is logically thought out and well styled from the computer graphics,(now dated) to furnishings, clothing, space suits, interior control areas, living spaces, and exterior space hardware.

The second film I praise is "20,000 Leagues Under the Sea". The design, both int. and ext. of the movie's submarine: Nautilus will probably never be matched for a "period piece".

Andrew Probert - <[ThPROBE < a t > aol.com](mailto:ThPROBE@aol.com)> - Northern California, USA

Without doubt it's Blade Runner.I knew the profession through looking "Steel Couture", a book about Syd Mead's works up to 1977.Not to mention all the work he did for Alien2, 2010, and so on.I owe to Mr. Mead be an Industrial Designer.

Patricio C. Ortiz - <[pcortiz < a t > uni-mdp.edu.ar](mailto:pcortiz@uni-mdp.edu.ar)> - Mar del Plata, Argentina

Sorry, I meant Sid Mead (I'm pretty sure that's how you spell it). Sorry Sid!!

Eugene Whang - <[ewhang < a t > axionet.com](mailto:ewhang@axionet.com)> - Vancouver, B.C.

Definitely Blade Runner. Sid Mead's vision of future design is completely believable. If you see all the production sketches he did for BR, you'll be amazed. Half of the concepts would make cool consumer products today!!

Eugene Whang - <[ewhang < a t > axionet.com](mailto:ewhang@axionet.com)> - Vancouver, B.C.

I would have to say my most inspiring design film is Blade Runner. It is a great film that shows technology in the future that is actually believable.

BILL GREEN - <[bgreen < a t > mc2-csr.com](mailto:bgreen@mc2-csr.com)> - Columbus OH www.mc2-csr.com/~bgreen

Metropolis...

(No, Silly not the magazine...The old movie...)

I could go on, but it's best if you just rent it and watch it for yourselves.

R. David L. Campbell - <[david < a t > thekangaroo.com](mailto:david@thekangaroo.com)> - Kangaroo

"Brazil!" I agree. "The adventures of Baron Von Munchausen" for the same wacky set reason.

"The Cabinet of Dr. Caligari", only if you went to film school, and if so you must include Eisensteins' "Potempkin" and of course Orsen Wells' "Touch of Evil"

But, lets be realistic, the gratest movie ever made with respect to set design, character design, script design in fact the whole strategic ball of wax was "Blade Runner--The Directors' Cut."

-Nuff Said

Mattehew Marcus - <[mmarcus < a t > id.iit.edu](mailto:mmarcus@id.iit.edu)> - Institute

of Design, Chicago IL

"Brazil" - This film provided an excellent commentary on the direction society could take if technology and design stalled. Kind of a retro-new age. It's a good rental...

J.Hofman -

"The Cabinet of Doctor Caligari" was designed to be a cinematic abstraction of the German Expressionists movement. The designers for the film created fantastic sets in order to emphasize the psychological disorder of the film's main characters. This film highlighted the focus on design in order to achieve its impact on the audience. Especially for being a film of the "silent" era, "Cabinet of Doctor Caligari" is remarkable.

Tony McCoy - <[tonym < a t > olstaffing.com](mailto:tonym@olstaffing.com)> - San Jose, CA

"Big" is certainly one of the greatest design films because its star (the Tom Hanks character) lands that great job with the toy company. He's hired for his insight into the creation of new toys, but essentially he is hired to be an industrial designer. It's looked upon as a dream job!

Also - most James Bonds films will fit into this category because of the generous use of contraptions. Was it "The Spy Who Loved Me" that had an amphibious vehicle?

Carla - <[cdiana < a t > hearst.com](mailto:cdiana@hearst.com)> - NYC

