The role of design practice in packaging sustainability in Australia

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[ declaration ]

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Areli Geraldine Avendano Franco
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abstract

Governments and organisations around the world have increasingly embraced the view that design has a key role to play in sustainability. Organisations associated with the food and beverage packaging industry have largely been scrutinised, particularly for their perceived overuse of packaging materials. Increasingly, such an industry has attempted to address issues of sustainability associated with their activities through various design approaches. While progress has been made, these approaches seldom consider the intrinsic complexities of the influence of the interactions of those involved in design decisions, or the contexts in which design is practised. Existing views of design within organisations are misunderstood as limited to ‘improving’ one or more aspects of the life cycle of packaging materials. Design theorists point out that such an understanding of design is what limits its significance in sustainability. It has been suggested that before appropriately articulating its role for sustainability, a fundamental revision of the current notions and practice of design in actual contexts is indispensable.

This Doctor of Philosophy (Ph.D.) investigation explores the current setting and character of the practice of design in the organisational context of the Australian Food and Beverage Packaging Industry (AF&BPI). A Grounded Theory (GT) approach is taken for the study, since it allows the researcher to enter the situation without preconceptions, permitting the emergence of theory implicit in the data, and positioning this as the outcome of the research. Thirty-six interviews were carried out with practitioners involved in design decisions across a range of organisations of the packaging industry. Topics addressed in interviews included issues related to interviewees’ perceptions on their roles; their involvement in design decisions; the current role of packaging and issues influencing its configuration; and notions of packaging sustainability. Through an inductive model consisting of an iterative process of systematically gathering and analysing empirical qualitative data, concepts grounded in the research data were drawn out. Correlations were made between interviewees’ interpretations and how such interpretations influence their actions and decisions, to explain how they continually resolve their main concerns. In GT, a review of existing literature only becomes relevant after the data collection and analysis process has begun, in order that it relates to the actual research situation.

The research outcome takes the form of a framework named Frames of Reference, since they portray in a conceptual sense the set of elements of design practices within the organisational context. According to these elements, three variations of the Frames of Reference are distinguished: fixed, flexible and versatile. The Frames of reference are
conceived with respect to the beliefs of interviewees regarding the nature of their roles, the ways of approaching them and the paths of action for performing these roles. The thesis concludes with directions on the essential transformations required in design practices in order that design plays a role in packaging sustainability. The framework offers a new vision through which to approach design practices: one where awareness and intentionality, either conscious or unconscious, are fundamental aspects of the ontology of design practices; and one that challenges basic elements underpinning its existence, and often in conflict with or in contradiction to notions of sustainability.

Frames of reference brings significance to both sides of a long-standing disagreement between the theory and practice of design. Ultimately, one major contribution of the Frame of Reference is that it is generated from a particular context of practice, namely, design for packaging sustainability; yet, it can be applied to a broader context, that is, design for sustainability in other areas.
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To facilitate the reading, the nine Chapters of this thesis are organised into three parts. According to the reader’s interest and/or level of expertise on design issues, these parts can be read in their order of choice. It is recommended, however, reading Chapter 4 Research Method before attempting to read part b. Understanding the concepts of Grounded Theory will help in learning how the data is collected, presented, analysed and conceptualised.

part a Research approach and context: this consists of four Chapters presenting the research proposal and background, literature review on design and packaging, and the research methodology employed for data collection and analysis;

part b Results and analysis: the four Chapters of this part are organised around the data collected on four of the five research questions: research question A, research questions B1 and B2, research question C, and research question D. Each Chapter presents the data collected through interviews and providing their corresponding analysis;

part c Discussion and conclusion: the final Chapter of this thesis gives answer to the research questions through the formulation of a series of hypotheses derived from the analysis of the data and correlations made with existing literature. It also gives answer to the ultimate research question E on the transitions needed to realise the role of design in packaging sustainability.
[ part a ]

Research approach and context

The first part of this thesis consists of three chapters that provide background and context to this investigation:

Chapter [ 1 ] Introduction offers an overview of the significance of researching design practices of organisations within the food and beverage packaging industry and its relevance in the area of sustainability.

Chapter [ 2 ] Elements and paradigms of design practice provides a theoretical background on design definitions and issues of its practice in the organisational context of the packaging industry and its relation to sustainability.

Chapter [ 3 ] The food and beverage packaging industry and issues of sustainability situates the research in the context of the food and packaging industry by discussing the role of packaging and relevant issues of sustainability.

Chapter [ 4 ] Research method outlines the methodological procedures undertaken, explaining the reasons for selecting a Grounded Theory approach for data collection and analysis.
Chapter [ 1 ]

Introduction

Central to this investigation is the review of the current setting and practice of design using the organisational context. The Australian food and beverage packaging industry is used as a case study. The current chapter presents arguments on the significance for undertaking such revision so it is possible articulating the role of design in packaging sustainability.

Section 1.1 briefly discusses contemporary issues of the food and beverage industry related to packaging and sustainability. It presents four different attempts made by various global initiatives to define packaging sustainability. In Chapter [ 3 ], a more in-depth discussion of issues of the food and beverage packaging industry issues is presented.

Section 1.2 gives context to the research by presenting a historical account of different approaches to address environmental issues associated with industrial activities as a result of increasing social awareness over the last fifty years.

Section 1.3 points out to conceptual differences between the terms ‘sustainable development’ and ‘sustainability’ which some authors have distinguished in terms of the emphasis given to economic growth being a major constraint for fully embracing the issues of sustainability.

Section 1.4 presents the research proposal providing arguments as to why a major revision of design practices within actual contexts is necessary to advance the current discourse of the role of design in packaging sustainability.

Section 1.5 delineates the reasons for selecting the case of Australian food and beverage packaging industry as the focus of this research. It also lays out the research questions and discusses the nature of the research enquiry. The use of a Grounded Theory (GT) approach as the research method and the use of the literature is briefly explained here and is discussed in depth in Chapter [ 4 ].

Section 1.6 delineates the scope and limitations of the research outcome, where the focus is established as placed on design practices as opposed to issues of the physical configuration of packaging.

Section 1.7 depicts the thesis outline.
1.1 Contemporary issues of the food and beverage packaging industry

The packaging industry as a whole became a global target of public scrutiny in the early 1970s due to environmental issues resulting from municipal waste, mainly associated with the excessive production of single-use and disposable items (Lewis 2003). Since then, pressure to reduce the amount of packaging materials used and manage other associated issues of sustainability has been put on organisations within the food and beverage industry (Lewis and Gertsakis 2001). During the 1990s, governments around the world began to acknowledge the role of design as a potential contributor to change in sustainability, and have encouraged organisations to take on design strategies to deal with the environmental and social issues related to their industrial and economic practices (Brezet and Van Hemel 1997, UNEP 2004, UNEP 2009).

The packaging industry, by contrast, has defined itself as to make a valuable contribution in society and the environment by reducing food waste (AFGC 2003, ECR Europe and EUROPEAN 2009, EUROPEAN 2011). Packaging has long been considered an essential element of contemporary food systems as the means for the systematised transportation and distribution of foodstuffs, enabling lower costs throughout the supply chain within a distribution and trading system dominated by major retail players (Brown and Williams 2003, Coles 2003, Robertson 2005). According to a joint report from the World Health Organisation (WHO) and the Food and Agriculture Organisation of the United Nations (FAO), approximately 30% to 50% of the global food is lost and wasted throughout the food supply chain due to inadequate means of preservation, protection, storage and transportation (WHO/FAO 2002). Food safety has increasingly become a major public health concern at a global scale (WHO/FAO 2002, WHO 2007); failure to ensure basic food safety standards may result in food losses (FAO 2011). Food and beverage packaging has been regarded as playing an important role in both preserving foodstuffs and maintaining their quality by allowing for more efficient distribution of foodstuffs making them available and accessible for consumption (Paine and Paine 1992, Gawith and Robertson 2000, Coles 2003, Robertson 2005, ECR Europe and EUROPEAN 2009, EUROPEAN 2011).

Questions have then been raised by the food and beverage packaging industry as to whether optimised or ‘more environmentally’ compatible packaging design reduces its ability to fulfil its fundamental functions (Bhamra 2005). In addition, it has been argued that the most critical environmental impacts related to foodstuffs actually occur at the production stage, and thus packaging only accounts for a small part of the impacts of the food and beverage industry based on life-cycle assessments (LCAs). The main
environmental impacts related to foodstuffs actually occur at the primary production stage, i.e., growing crops and raising cattle, including global warming related to land degradation and air and water pollution, and loss of biodiversity (Tischner and Kjærnes 2010). In other life cycle stages, such as food production, storage, and transportation, the energy usage is a major impact. Packaging is only responsible for approximately 5% of the total energy usage whereas road transportation is responsible for 3% (Krutwagen and Lindeijer 2001, Eberle et al. 2006, Tischner and Kjærnes 2010).

Food and beverage packaging is highly valued due to the economic advantages that it carries in its various functions including containing, protecting, and promoting a product as well as communicating its attributes (Southgate 1994, Stewart 1994, Stewart 2007, ECR Europe and EUROPEN 2009, Ambrose 2011, EUROPEN 2011). The global food and beverage packaging industry is worth over US$238 billion. In terms of the type of packaged products, foodstuffs and beverages currently make up more than half of the overall global packaging industry: beverages 18% and food 38% (Economy Watch 2010) (Figure 1.1).

One of the key issues and challenges faced by the food and beverage packaging industry has been the great deal of attention given specifically to environmental impacts associated with the amount of packaging materials used and disposed. Political pressure and public concern have grown in relation to consumption of non-renewable resources, the packaging materials used and the waste that results from packaging (James et al. 2005). More recently, activities and products of the packaging industry have been
associated with global warming. Particularly, packaging manufacturing and consumption has been related to the generation of greenhouse gas emissions through transportation, energy consumption and fugitive emissions from production and manufacturing processes (Stewart 1994, Sterling 2007, Jedlicka 2008, Lofthouse et al. 2009).

Packaging regulations, both voluntary and mandatory, began to be introduced by governments around the world in the early 1970s to regulate packaging waste, though they were mainly focused on the recycling of packaging materials (Denison and Ren 2001, Bhamra 2005). A well-known example is the German government, which introduced the Packaging Ordinance in 1991 as a response to claims that the packaging industry contributes to landfill as well as misuses and wastes valuable materials (Denison and Ren 2001). The objective of the Ordinance is, for the most part, to take back all packaging from households for recycling (closed-loop), placing the responsibility on the producers (European Union 1994, Ackerman 1997).

In 1992, the Australian New Zealand Environment and Conservation Council (ANZECC) introduced the National Waste Minimisation and Recycling Strategy (the Strategy) in order to minimise waste, use resources more efficiently and manage wastes better (EPHC 2010). Then, in 1999, the Strategy was replaced by the National Packaging Covenant (NPC) which was a self-regulatory and voluntary agreement between the parts of the packaging supply chain and all three levels of government based on principles of shared responsibility (ANZECC 1999). The NPC focused upon increasing recycling targets and reduce the amount of packaging waste to landfill (ANZECC 1999, NPCC 2005). Signatories to the NPC required producing Action Plans and Annual Reports for evaluating and improving environmental outcomes, respectively. A revision of the NPC in 2005 resulted in the provision of general principles for the design of packaging through an Environmental Code of Practice for Packaging (ECoPP)(the Code)(NPCC 2005). The Code also provided more detailed Environmental Guidelines for Packaging (Guidelines) to assist organisations to implement the principles in their product development process. In 2010, the agreement was further reviewed and renamed the Australian Packaging Covenant (APC) (APCC 2010, 2011). The scope was then broadened to encompass life cycle principles and the Sustainable Packaging Guidelines (SPG) were introduced. The ‘guidelines’ aim to

[…] assist Covenant signatories and others to review and optimise consumer packaging to make efficient use of resources and reduce environmental impact without compromising product quality and safety (APCC 2011, p. 21).
To engage a broader range of organisations, the SPG offers sharing a common vision among all stakeholders throughout the packaging supply chain. A definition and guiding principles of what ‘sustainable packaging’ is set to be are provided in the SPG. Its focus is mainly put on issues of design, manufacturing and end-of-life management of packaging materials. Rather than regulation, however, the principal drivers to increasingly engage the packaging industry in the management of the environmental impacts of packaging are social perceptions and pressure (Verghese et al. 2010).

The global packaging industry has increasingly recognised the need to address sustainability and has acknowledged that design can contribute to packaging sustainability. As a result, a range of resources has been available to the industry over the last decade, in the form of indicators, metrics, frameworks, decision-making instruments, toolkits, online resources and paper-based publications related to design, packaging and sustainability (EnviroWise 2002, ISO 2002, INCPEN 2003, SPA 2005, SPC 2006a, Verghese et al. 2006, Sterling 2007, Jedicka 2008, COMPASS/SPC 2009, ECR Europe and EUROPEN 2009, WRAP 2009, APCC 2010, 2011, SPA 2010, CGF 2010, 2011, EUROPEN 2011, Fitzpatrick et al. 2012, Packaging Sustainability 2.0 2011). Many organisations have adopted one or more of these resources, while others have developed their own or have used governmental regulations as a guide for practising corporate social responsibility (Stegall 2006, Verghese et al. 2010). In addition, attempts around the world have been made to define what packaging sustainability means by four initiatives:

a) in Australia, by the Sustainable Packaging Alliance (SPA 2002, Lewis et al. 2007, SPA 2010);

b) in the USA, by the Sustainable Packaging Coalition (SPC 2006a);

c) in Europe, by The Consumer Goods Forum (CGF 2010, 2011); and


Each of the four initiatives provides guidance on how to optimise the performance of packaging while minimising the risks of supply chain inefficiencies. Also, each provides a framework with principles, the intention of which is to assist in decisions across all stages of the life cycle of packaging (SPC 2006b, Lewis et al. 2007, ECR Europe and EUROPEN 2009, 2011, APCC 2010, 2011, CGF 2010, EUROPEN 2011, Fitzpatrick et al. 2012). It is important to acknowledge, however, that the scope and objectives of such initiatives are limited and require considering the complexities or context of practices for its implementation. One of the most tangible benefits of the available resources and initiatives is that organisations
have progressively begun to take seriously the social and environmental responsibility that they have for their activities (Mackenzie 1997, ISO 2002, Tischner 2005).

An additional issue that organisations perceive as a constraint for change is the great influence that retailers have on the configuration of packaging (Sterling 2007, CGF 2010, 2011). Retailers’ business agendas impose pressure upon the packaging supply chain (SPA 2004a, Verghese 2008); they are increasingly introducing own-brand products, and are also involved in the design of their packaging (Verghese et al. 2010). In recognition of their influence over the supply chain, major global retailers have introduced initiatives to address issues of sustainability over the last six years. Drivers for packaging sustainability at the retail level are mainly based on cost reductions and improved supply chain efficiencies through reductions in materials and energy consumption. At the end of 2006, US retailer Wal-Mart released its packaging scorecard providing a set of criteria for suppliers to reduce packaging across its global supply chain, with a goal of 5% by 2013 (Wal-Mart 2007). In January 2007, Marks and Spencer in the UK announced its engagement to a five-year commitment named ‘Plan A’, which involved five main objectives: becoming carbon neutral; sending no waste to landfills; extending sustainable sourcing; setting new standards in ethical trading; and helping customers and employees live a more healthful lifestyle (Marks & Spencer 2007). In the same year, Australian retailer Woolworths Limited released its sustainability Strategy 2007-2015, named “Doing the right thing” (Woolworths 2009). Through a range of targets and commitments, a major objective set out by the strategy relates to reducing carbon emissions across their organisations practices. In terms of packaging, the focus is put on reducing primary packaging, minimising waste and optimising secondary packaging from private label products (Woolworths 2009). Organisations gradually have been required to follow packaging strategies adopted by retailers, including using recyclable packaging materials or with recycled content and reducing the weight of materials (Marks & Spencer 2007, Wal-Mart 2007, Woolworths 2009).

The available range of approaches to packaging sustainability has certainly assisted decisions made by design practitioners and organisations regarding issues of the lifecycle of products and their packaging. Organisations have now began to consider changes in manufacturing, design, logistics, marketing, business structures and relationships with organisations of the food and beverage packaging industry (Lewis et al. 2007). Efforts made by organisations, however, frequently result in compromised measures (Fiksel 2012). Organisations tend to concentrate on isolated environmental issues of packaging (Burall 1996, Brezet and Van Hemel 1997, Berchicci and Bodewes 2005, Chapman and Gant 2007a). Instead, an integral approach of both product and packaging as a part of the
same life cycle should be taken (Boylston 2009). A major issue associated the latter is that food and beverage packaging has itself become a large industry of the modern world (Stewart 2007).

Other significant problems to overcome are both the isolation between departments and the level of specialisation resulting in conflicting agendas and operational methods within organisations (Boylston 2009). The role of design has often been isolated from important sustainability considerations within packaging design. Design within organisations is largely perceived as merely concerned with decisions associated with material selection or the implementation of design strategies aiming to ‘improve’ the environmental aspects, for the most part constrained by cost (Chapman and Gant 2007b, Boylston 2009). Even when an appropriate design strategy has been selected, organisations tend to embody its principles in unstructured and informal ways, without proper integration across the organisation (Stegall 2006).

Then, the question remains: how can design move its focus from reducing the environmental impacts of products and packaging towards design practices that effectively embrace issues of packaging sustainability?

1.2 Research context

In the early 1970s, Victor Papanek emphasised that design has a social and ethical responsibility to effect real and beneficial change in the world (Papanek 1972). This apparently advantageous position of design has been described by Papanek (1972) as twofold. On the one hand, design is a potential vehicle by which to bring benefits to society through addressing people’s real needs in innovative ways, through and beyond the creation of objects. On the other hand, design, along with use and users of products, has been a major promoter of a growing material culture, contributing to unsustainable production and consumption patterns and the destruction of the planet’s resources. An underlying premise of this is that design is influential (Papanek 1972, Fry 1988, 1989, 1992a, 1992b, 2001, Mackenzie 1997, Datschefski 2001, Lewis et al. 2001, Birkeland 2002, ISO 2002, McDonough and Braungart 2002, Bhamra 2004, Bhamra and Lofthouse 2007, Chapman and Gant 2007a, Fuad-Luke 2009, Shedooff 2009, UNEP 2009, APCC 2010, Fiksel 2012) (Papanek 1972) asserted that if design is intended to significantly contribute to sustainability it ought to move away from servicing a market-driven industry and should engage in social and environmental issues.
In an attempt to establish a common view among nations as to what is an effective path for better and more responsible industry practices, many years of discussion and divergence have passed. A progression of business approaches to environmental issues of industrial practices from the 1960s to the 2010s is depicted in Figure 1.2.

![Figure 1.2 Progression of business approaches to environmental issues of industrial practices](Figure.jpg)

In the 1960s, reactive solutions to environmental issues and compliance with regulations were among the predominant business approaches. By the 1970s, the U.S. Environmental Protection Agency (EPA) was formed and various laws aiming at cleaning up industry processes were established. Throughout the 1960s and 1970s, the link between consumerism and the role of design was questioned by other ‘postmodern ecologists’ and ‘alternative designers’ such as Packard (1957), Fuller (1969), Schumacher (1973), Bonsiepe (2006). By the 1980s, increasing concerns about the consequences of human activities culminated in the idea of the formulation of a ‘global agenda for change’. End-of-pipe responses were increasingly viewed as ineffective in the long-term. A connection between cleaner production and operational efficiency was identified. This led to better industrial practices, including efficient use of resources, elimination of toxic or hazardous substances, process simplification, source reduction, and recycling of production wastes.

In 1987, the United Nations World Commission on Environment and Development (WCED) released a report entitled *Our Common Future*, also known as the *Brundtland Report*. With this, the concept of ‘sustainable development’ (SD) was first introduced into the international policy debate, defined as:
development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987, p.45).

The report emphasised that principles for sustainable development embrace social and ethical as well as environmental aspects and that different approaches need to be considered by all those involved in the production and delivery of goods (WCED 1987). Following the release of the Brundtland Report, the concepts ‘sustainable development’ and ‘sustainability’ were then used indistinctively (Gertsakis and Lewis 2003, Bhamra and Lofthouse 2007). An extension of design terminology was developed that incorporated environmental considerations into design and aimed to embrace more holistic principles. This included such terms as ‘ecodesign’ (Ryan 1995); ‘environmentally conscious design’ (Papanek 1995; Fry 2001); ‘design for the environment’ (DfE) (Mackenzie 1991, Stroufe et al. 2000); ‘Life Cycle Thinking’ (Giudice et al. 2006, Fuad-Luke 2009); ‘EcoRedesign’ (Gertsakis et al. 1997, Van Hemel 2001); and ‘green ecodesign and sustainable design’ (Fry 1994, Lewis and Gertsakis 2001, Bhamra 2004, Tischner 2006, Walker 2006).

Industry stakeholders then began to recognise that a defensive approach towards environmental, health and safety issues was impractical. Instead, organisations took a more constructive approach that reassured their values. Concepts such as ‘product stewardship’ emerged as an ethical commitment to the management of their infrastructure and products, including manufacturing processes and distribution through ‘shared responsibility’ or ‘extended product responsibility’ (EPR) (Lewis 2005, Fiksel 2012).

With the beginning of the new millennium, issues critical to humanity, including the exhaustion of fossil fuel resources and greenhouse emissions contributing to global warming, were ratified by scientists, economists and politicians (IPCC 2001, Bakker 2006). In fact, contemporary global social and environmental problems resulting from industrial growth have now become unavoidable design concerns (Walker 2004). As part of their efforts to address such issues, organisations around the world have progressively made use of environmental design approaches. These approaches are based on principles of dematerialisation (source reduction); energy and material conservation; detoxification; recovery; recyclability; and safety to humans and ecosystems (Tischner and Charter 2001).

More progressive organisations have developed their own design strategies, or have identified innovative ways to comply with governmental regulations and practice corporate social responsibility (Dresner 2008). It seems that organisations around the world began to recognise that there was business value in considering issues of sustainability. This
was a main driver for the evolution of producer responsibility into the embracement of principles of corporate citizenship and sustainable development, including a broader commitment to social and economic well-being. Pioneer organisations moved from the existing compliance mentality towards proactive management, involving other stakeholders and recognising that the continuing survival of their businesses depends upon ethical practices across their supply chains (Tischner 2001, Nielsen and Wenzel 2002, Vezzoli and Manzini 2008).

1.3 Why sustainability?

The rise of the green movement in the 1960s brought attention to the major social and environmental consequences of many industrial and economic practices. The 1962 publication of Rachel Carson's *Silent Spring* gave rise to the environmental movement of the 1960s. The book denounced the chemical industry for the detrimental long-term effects of air-borne pesticides on the environment, her argument built against claims made by the chemical industry regarding the safety of pesticides. The ethical and environmental issues that Carson raised set a precedent for the encouragement of responsible and carefully-managed industry actions when dealing with the environment.

Several years later Paul R. Ehrlich drew attention to an important element in the current sustainability debate in his 1968 book *The Population Bomb*; namely exponential population growth as a factor in environmental degradation. The political and social controversies of such a statement diminished its relevance in the environmental debate. However, in the same year and for the first time, global environmental problems, including pollution, resource loss, and wetlands destruction were discussed by scientists from around the world at the UN Biosphere Conference in Paris. The main argument, between 2,200 experts, pointed the correlation of these global problems, and warnings were given as to the rapid depletion of the Earth’s resources by humanity (Runyan and Norderhaug 2002). This has resulted in a transformation of industry attitudes towards environmental restoration and social responsibility (Fuad-Luke 2002, Stegall 2006, Bhamra and Lofthouse 2007). Issues identified include the depletion of natural resources; pollution of air, water and soil; and risks posed to human health, wildlife and ecosystems, among others (Fiksel 1996, Fuad-Luke 2009). Inevitably, the world faces new challenges and, unmistakably, the green movement represented a turning point for the rethinking of existing notions of post-industrial material culture. Furthermore, it calls into question the role that design has had in upholding the “notion of economic progress” (Fuad-Luke 2009, p. xix) at the expense of environmental detriment.
Environmental disasters of the time, including droughts, deforestation, ozone depletion, and nuclear disasters, added to the pressure of dealing with the consequences of global irresponsible production and consumption patterns. In 1972, at the UN Conference on the Human Environment in Stockholm, representatives from 114 countries came together to identify possible ways to address the warnings given at the UN Biosphere Conference four years earlier. While the conference produced a series of recommendations for government action, it had been argued that effective alternatives to environmental issues have never been fully elucidated (Sachs 1999). Also in 1972, an association of scientists and political leaders known as the Club of Rome published The Limits to Growth, a report in which they drew attention to the growing pressure on natural resources from human activities. Predictions were made that the Earth’s limits would be reached in the following 100 years if rates of population growth, resource depletion and pollution generation continued at the pace of the time (Meadows et al. 1972).

The terms ‘sustainable development’ (SD) and ‘sustainability’ have in many cases been used interchangeably. As mentioned in Section 1.2, the mainstreaming of the concept of sustainable development grew out of a number of environmental movements. A major premise of the concept states that current needs should be met without compromising those of future generations; yet, the continual growth of the global population at exponential rates has been pointed out as adding more pressure to issues of sustainability.

Suggestions that interpretations of SD differ in the two hemispheres have been made. In the North, SD has been predominantly understood as another new environmental concept, while in the South, the term has been taken as meaning poverty alleviation and economic development (Spangenberg 2002). Along the same lines, Simon Dresner (2008) remarks that the definition of sustainability has connotations of equity between humans and within generations but also between humans and other life forms. Furthermore, in making clear his position against models that capitalise on natural resources, Dresner asserts that “sustainability is an idea with certain amount in common with socialism” (Dresner 2008, p.4); since the social dimension of sustainability strives to deliver ‘equal’ shares of these capitals.

Sachs (1997) makes a distinction between ‘sustainable development’ and ‘sustainability’, arguing that sustainable development suggests an emphasis on development and economic growth, whereas sustainability refers to a more holistic approach, in which social and ethical issues are also considered. To better understand this distinction, Sachs argues that the concept of ‘development’ is subject to interpretation, hence subjective, and
it cannot, therefore, be easily identified with a particular strategy or programme, but ties many different practices and aspirations to a common set of assumptions. Whatever the theme on the agenda in the post-war era, the assumptions of "development" like the universal road – the superiority of economics, the mechanical feasibility of change – tacitly shaped the definition of the problem – highlighted certain solutions and consigned others to oblivion (Sachs 1997, p.1).

On the other hand, he asserts that,

the concept of ‘sustainability’ can, to some extent, be expressed objectively by way of a system of indicators. Nevertheless, it is essentially a normative concept rooted in three value judgements. First, it postulates the right of people alive in the future to the resources of our earth […] Second, another question can be derived from the sustainability debate: What environment do human beings want? […] Third, the concept of sustainability contains another necessary dimension alongside the ecological one: the dimension of international justice (Sachs et al. 2000, p.10)

Effectively, Sachs’ distinctions between ‘sustainable development’ and ‘sustainability’, both influenced by economics, lie in their emphasis. The significance of Sachs’ reflections is that they challenge the assumptions of unlimited growth that seem to dominate in the capitalist system of production and consumption.

In June 1992, at the Earth Summit held in Rio de Janeiro, 152 world leaders signed conventions on biological diversity, desertification, a framework on climate change and principles for sustainable forestry. These were documented in Agenda 21: The Earth Summit Strategy to Save Our Planet, which summarised the hundreds of proposed solutions in the conference report. The dimensions of the debate transcended national and industrial boundaries, touching upon issues that included export of pollution to developing countries, international equity of environmental regulations, as well as sustainability of population and industrial growth in the face of limited planetary resources. The report was based on a number of agreements adopted and signed by most of the world’s national leaders. The North-South tensions that marked the negotiations of the Agenda 21 chapter on Changing Consumption Patterns gave way to a pragmatic debate. The debate centred on the recognition by the Organisation for Economic Co-Operation and
Development (OECD), governments and businesses that change can occur by taking into account the correlation between production and consumption practices. Agenda 21 states that:

> the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries, which is a matter of great concern, aggravating poverty and imbalances (UNEP 1992).

The links between consumption and production have been considered as key issues towards sustainable development, yet little consideration has actually been given to the integration of production and consumption activities (UNEP 2004). It was not until the Earth Summit that the terms ‘sustainable production’ (SP) and ‘sustainable consumption’ (SC) were even brought into discussion. The Brundtland Report refers to sustainable production as:

> goods and services designed, manufactured and delivered in such a way that the need of present generations is met, without depriving future generations of their ability to satisfy their needs for products and services (UNEP 2004, p.5)

On the other hand, sustainable consumption is referred in terms of:

> the use of services and related products which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of wastes and pollutants over the life-cycle so as not to jeopardise the needs of future generations (UNEP 2004, p.7).

Producers and consumers have a role in shifting to more ‘sustainable’ production-consumption systems (Tischner and Kjærnes 2010). Greater precision in the definition of key terms is still required, accompanied by the need to distinguish between unsustainable and sustainable behaviour and between levels, patterns and rates of change of consumption (Spangenberg 2002). Yet, the link between SP and SC has been identified as a significant factor that industries are required to acknowledge as components of an integrated single system and not as two different processes (UNEP 2005). Such a connection holds both opportunities and dangers. It would be highly positive, on the one hand, if the design, production and delivery of goods and services were combined with economic interests...
and technological capacity (Sachs 1997). On the other hand, it would be a great threat if the result of this were that prosperity came to be determined by ‘natural capital’ rather than by industrial competency (Joyce and Woods 2001). Hawken et al. (1999), in their book Natural Capitalism: Creating the Next Industrial Revolution, state that:

> while human-made capital has been accumulated on vast levels, natural capital, on which civilization depends to create economic prosperity, is rapidly declining and the rate of loss is increasing proportionate to gains in material well-being (Hawken et al. 1999, p.2).

The implications of this declaration are both ethical and environmental. Development has been used as a justification for the commoditisation of natural resources, which inevitably requires rethinking the value of social and natural resources in the context of business. The ambitious objectives of Agenda 21 were accompanied by equally ambitious investments required by developed nations to support the agenda; unfortunately, such investments did not materialise in subsequent years.

The concept has been subject to a variety of interpretations; the understanding of the core idea even now remains ambiguous (Fuad-Luke 2009).

### 1.4 Research proposal


Without attempting to elucidate underlying issues of design, fundamental questions of the ontological type are the starting point of this investigation (Figure 1.3): **what is design?** and, **how are design practices conducted within specific contexts?** Only after understanding design’s character and setting in specific contexts of its practice, is it possible to then ask, **what is the role of design in sustainability?**
Design has largely been portrayed as a main originator or specifier concerned with the appearance and technical specifications of mass-produced objects within an industrial and economic context (Papanek 1972, Julier 1993, Walker 2006, Fry 2009, 2011). Within organisations, design has frequently been limited to responding to commercial briefs often lacking a deep understanding of environmental, social and ethical consequences inherent to products and services (Papanek 1995, Walker 2006, Fry 2009, 2011). Two contexts of practice have been identified as reasons why the role of design is disconnected from critical design decisions:

(i) design as a service industry — this undoubtedly will remain the zone of operation for many designers but needs to be countered by the formation of a dynamic culture of design innovation of sustainable difference. And,  
(ii) a continuation of a restricted view of design by designers — within which the dominant model of design history and theory are complicit (Fry 2001, p.1)

Fry’s position challenges not only the contexts of design practices but, fundamentally, the very nature of such practices. Contemporary design practices have developed through the rise and extension of ‘modernity’; connotations given to the term ‘design’ have therefore been largely embedded in the ideological paradigms of globalised capitalist
means of production, modes of consumption and cultures (Fry 2011). Along similar lines, Walker asserts that design has failed in addressing environmental and social concerns, due to a major aesthetic emphasis given to products and the speed with which products become obsolete:

"Ever since the early years of the 20th century, when mass-produced consumer goods started to become widely available, products have been promoted as ‘new’ and ‘leading edge’ based on two major features – aesthetics and technology. [...] neither has given us a lasting and meaningful material culture. Rather, they have contributed to unsustainable, inherently damaging characteristics of our current design and production approaches (Walker 2006, p.11)."

Industrial production and consumption of a diverse variety of products and their packaging have led to the depletion of natural resources along with climate change, ozone depletion, air pollution and quality, waste management and additional environmental and social consequences (Fiksel 1996, Gertsakis et al. 1997, Fuad-Luke 2009, UNEP 2009). Wahl and Baxter (2008) assert that “[d]esigning for sustainability not only requires the redesign of our habits, lifestyles, and practices, but also the way we think about design” (p. 72).

Nadler (1980) suggested that before design can be considered of significance in society, it is first necessary to define with which phenomenon ‘design’ is concerned. Further, for considering design as an agency of change for sustainability, design theorists have identified the indispensability of undertaking a major revision of current design practices. Two major propositions support such arguments. The first is that reviewing design practices in actual contexts allows an understanding of what brings design into existence, recognising how this is embedded in the actions and interactions of those involved (Dilnot 1984b, Schön 1984, Burall 1996, Brezet and Van Hemel 1997, Charter 2001, Fuad-Luke 2002, Downton 2003, Dreyfuss 2003, Friedman 2003, Dorst 2006, 2007, Buchanan 2008). The second is that by explaining the intrinsic nature of design practices it is possible to articulate what essential transitions are needed to actualise the role of design for sustainability (Berkel et al. 1997, Charter 2001, Fry 1992b, 1994, Stegall 2006, Walker 2006, Fuad-Luke 2009, UNEP 2009, Fiksel 2012).

Design, as an integrative discipline, intersects with other disciplines, connected to each other through its practice, either directly or indirectly trying to resolve a design situation.
These disciplines include technical, environmental, policy, marketing and economic perspectives (Lewis and Gertsakis 2001, Fuad-Luke 2009), as portrayed in Figure 1.4.

![Diagram of Interdisciplinary Interactions within Design Practices]

**Figure 1.4** Portrayal of the Interdisciplinary interactions within design practices  

According to Figure 1.4, design practices are made up of the actions and interactions of those intrinsically involved in decisions within design processes across a series of design activities required to arrive at a material or immaterial design outcome. Fry proposes that design practice is

> ...what brings designers into being as such and thereafter sustains them. It is what forms and animates their ontology as designers. It is thus implicit in the essence of what it is to be a designer, the design act and the character of the designed (Fry 2009, p. 25).

This definition is useful to point out that design practices are constructed by anyone that is implicitly or explicitly involved in design processes, design activities and/or design outcomes regardless of the job title of their profession. In other words, design practices refer to the actions undertaken by anyone for whom design is an essential object of their practice, either in an abstract or practical way. In his attempt to explain the nature of design practices, Lawson compares the complex relationships of those involved in such practices to those that take place in games:
the moves in this game are those actions and decisions that each party takes on his own and then presents to the other. [...] It is important to appreciate that co-operation in this process is an important ingredient, just as it is in many team games. [...] (Lawson 1980, p.178).

In other words, design practices are made up of proactive and synthetic processes and activities directed towards an outcome. They are about what happens, the actions and interactions, in a particular situation that is context-driven, with its own concerns and restrictions (Fallman 2008).

1.5 Research questions and nature of research enquiry

To give context to the research, this investigation proposes to use as the case study the organisational context of the Australian food and beverage packaging industry (AF&BPI). There are two main reasons as to why this industry makes an interesting example for the investigation (see Section 1.1). Firstly, there is an intricate product-packaging relationship: foodstuffs are products without which their packages would not exist and, in turn, packaging needs to be designed in relation to the product. In terms of its design, package design presents an interesting challenge as it also needs to balance a series of requirements, which paradoxically make it more complicated than the actual product to be packaged. The major issue here is that those involved in the processing of foodstuffs are frequently different to those involved in packaging design within organisations. Secondly, the packaging industry is a business sector that has recognised design as a key contributor to packaging sustainability (EnviroWise 2002, Lewis 2003, NPCC 2005, ECR Europe and EUROPEAN 2009, WRAP 2009, APCC 2010, 2011, CGF 2010, 2011, EUROPEAN 2011, SPA 2005, 2010). The diversity of factors to be considered in food and beverage packaging design and the separation of decisions between product and packaging are critical issues in packaging sustainability (Denison and Ren 2001).

The main objective of this research is to develop explanations on how design practices are conducted in organisations within the AF&BPI context. This will allow generating theoretical propositions on the necessary transitions to articulate the role of design practice in packaging sustainability. To do so, six research questions have been established. The first research question is:

[A] What is the current setting and character of design, and how are design practices conducted within the organisational context of the AF&BPI?
The emphasis is placed on identifying factors in the way design is conducted, explaining what brings design into existence, and what influences the way those involved in design practices construct and sustain their ‘reality’. Such ‘reality’, embedded in the actions and interactions of those involved, is constructed in and through social interactions which are constantly changing phenomena and are, as a consequence, variable. Subsequently, it is necessary to distinguish dependencies on contingent variables within such ‘reality’, explaining trade-offs, bargaining processes and obstacles for sustainability, and as a consequence what is needed to allow transformations in design practices. The following four research questions are then posed:

**[B1]** How is the role of packaging defined and what factors influence the changing configurations of packaging?

**[B2]** How do perceptions of packaging success relate to the notions of packaging sustainability?

**[C]** How is the structure of the AF&BPI influencing the setting and realisation of packaging sustainability?

**[D]** What transitions are required to move towards packaging sustainability?

Only after giving answer to these questions it is possible to give explanations to the research’s ultimate question:

**[E]** How might transitions be realised so that design effectively actualises its role in sustainability?

A qualitative approach is taken to answer the research questions since qualitative research allows for a more open and emerging posture as opposed to that in the quantitative one. As the main source of data gathering, a series of interviews was conducted with those directly or indirectly involved in design practices within the organisational context of the Australian food and beverage industry. The review of literature complements the research process, yet the interviews remain the main source of data. A Grounded Theory (GT) strategy for collecting and analysing data is undertaken, consisting of an inductive and iterative process for gathering data, in which the generation of theoretical propositions derived from data collection is situated as the outcome of the research (Figure 1.5).
Using a GT approach seeks for understanding of the research situation as it exists, leaving aside any preconceptions, thus, allowing issues to emerge organically. The Glaserian approach to GT was chosen for this investigation. Glaser (1978) strongly argues against the review the literature at the beginning of the research so as to avoid ‘forcing’ the researcher’s preconceptions on the data. A grounded theory is inductively generated; one does not begin with a hypothetical theory and, then prove it. Rather, the researcher begins by collecting the data in the field. Then, the analysis of the data starts and concepts begin to emerge (Strauss and Corbin 1990). Glaserian GT proposes comparing and contrasting the emerging theory with the existent literature at a later stage, especially when the substantive theory is beginning to emerge. The relevance of the literature review in GT lies in providing the theoretical background and setting the context for the research based on what emerges in the research data. It is not intended to be an exhaustive survey of theory on the area of study and should not guide or validate the research outcome. Likewise, when a topic comes out in conversation, the review of literature becomes relevant (Glaser and Stern 1998). As a result, it is possible to build propositions around the research situation explaining the actions in how those being studied continually resolve their main concerns. The main concern in Glaserian GT is the variable that motivates actions that attempt to resolve such concerns (Section 4.3.2) (Glaser 2001).

Interviews allow for understanding of how interviewees’ actions shape their own reality, through interactions with other practitioners, and through the way in which these
interactions influence the decisions they make and the outcomes they arrive at. Topics discussed included the interpretation of interviewees’ view of their roles and decision-making and the type of involvement they have in the design of packaging. Interviewees’ perspectives on issues in the packaging industry, including the role of packaging and issues of its configuration, notions of sustainability and challenges faced by the packaging industry, were also discussed. Issues relating to the research method are further explained in Chapter [4].

1.6 Scope and limitations

While an appropriate context through which to study the broader role of design for sustainability, the selection of the Australian food and beverage packaging industry context as a case study is also based on a personal interest of the author of this thesis. It builds further upon prior Masters Research: An Eco-Packaging System for Organic Produce (Avendaño 2005). One of the main conclusions from this research was that the role of design in packaging sustainability goes beyond material selection and the ‘improvement’ of its end-of-life management. The Master’s thesis posed fundamental questions of the relationship between the product and the need for packaging, and challenged the assumptions of specific contexts of use (Avendaño 2005).

Arguments have already been presented to explain why this current Ph.D. investigation looks at design practices as opposed to focusing on the outcomes of the design activity. This research will refrain from prescribing material selection and other issues with the physical configuration of packaging which has been done elsewhere. In Section 1.1, four global initiatives aiming to guide design practitioners in choosing an appropriate design approach were introduced. Their focus on technical issues limited to the physical configuration of packaging was briefly discussed. In addition, many tools and guidelines have been developed largely by US and UK/Europe-based organisations, and others in Australia. They vary in format, application, indicators, scope and mode of delivery and region of application (Verghese and Lockrey 2012). These tools will be discussed in-depth in Chapter [3]. One of the main issues with these tools is that they focus on redesign, and a variety of assumptions on the appropriateness of the existence of a given package has to be made. Such a focus implicitly assumes that situations faced in the practice of design are repeatable and the way to address them predictable. In reality, design faces unique situations that are subordinated to their context of practice and consequently, are unpredictable. The use of tools may then be ineffective as they lack an appropriate understanding of specific situations. Therefore, it becomes essential to acknowledge the
multidisciplinary character of design in which complex decisions are made in intricate and different stages and specific contexts of practice.

In terms of the limitations of the research, it is important to clarify that while design practices are reviewed in the organisational context of the AF&BPI, the objective of this research is far from the development of an organisational management theory. It is also essential to note that the objectives of this research are unrelated to defining packaging sustainability; neither is its purpose to engage in discussions on preferable materials or selection of design strategies for the design of packaging. The objective goes beyond issues of the physical configuration of packaging. Furthermore, the research seeks to distinguish dependencies on contingent variables within design practices, and concepts grounded in the data can be generated to then develop a general theory of design for sustainability. Instead, it seeks to generate a theoretical framework that portrays existing notions of design within such an industry to articulate the role of design practices in sustainability based on actual contexts of practice. Since design for sustainability as a research area is relatively new (Walker 2006), there is a need to generate grounded concepts for explaining factors that influence the way those involved in design practices construct and sustain their ‘reality’ (Glaser 1994a).

The outcome of the research is intended for all those who are concerned with characterising the current role of design in the organisational context towards packaging sustainability. That includes a variety of individuals from different organisations ranging from marketers, branding consultants, designers, packaging technologists, environmental managers, policy makers and packaging consultants. It also includes those who are directly involved in the planning and development of the physical configuration of products and their packaging. Thus, both theoretical and practical aspects of packaging design are considered. The aim of using a GT approach is to explain the way those involved in design practices resolve their central concerns regardless of the time and place (Glaser 1994b). Therefore, no differentiation between professional backgrounds is made in the analysis of the data. Instead, a more abstract approach to the practice of design is taken in an attempt to ensure its significance for all those involved. It is important to note that the proposed framework is generated from a particular context, namely the organisational context of the AF&BPI; yet, the theory should be readily applicable to a general practice. That is, design for sustainability in other industry sectors. This is a central issue of the theory and practice of design.
1.7 Outline

This thesis is divided into nine chapters, as illustrated in Figure 1.6.

[part a] research approach and context

1. Introduction
2. Elements and paradigms of design practice
3. The food and beverage packaging industry and issues of sustainability
4. Research method

[part b] results and analysis

5. Packaging design practice research question [A]
6. The idea of packaging and its validation research question [B1]
7. Packaging: sustaining the unsustainable? research question [B2]
8. Sustainability: option or necessity? research questions [C] & [D]

[part c] discussion and conclusion

9. A transition to packaging sustainability research question [E]

Figure 1.6 Thesis structure

[part a] Research approach and context is the introductory component of the thesis, and includes four chapters that correspond to the preliminary phase of the research: the research proposal, the literature review and the research method. Chapter [1] Introduction presents arguments to validate the research proposal explaining that the research reviews design practices using the organisational context of the Australian food and beverage packaging industry as a case study. The research questions are presented and the research method and limitations are briefly explained. Chapter [2] Elements and paradigms of design practice presents an overview of themes that became relevant to the research based on the data collected, according to the GT approach. A discussion on the meaning and significance of professional design within organisational contexts, and two main paradigms of design practice is presented based on existing design literature. It also includes a historical account of key events over the last fifty years that have raised awareness around the environmental crisis, and its intersection with issues of sustainability is elucidated. Chapter [3] The food and beverage packaging industry and issues of sustainability gives an overview of the history of food systems in relation to packaging. It also includes different perspectives on the role of food and beverage
packaging. The structure of the organisations pertaining to the packaging supply chain is described to give context to the research. Packaging design and issues of sustainability derived from the use of packaging in the food and beverage industry are also discussed. Chapter 4 Research method makes a case for the research approach, data collection method and data analysis strategies selected. The relationship between theory and research is explained, a relationship in which theory is situated as the outcome of the research. This is followed by a discussion on the suitability of using Grounded Theory as the data-gathering and analysis strategy. Reasons for using interviews as the main source of data collection and the selection of interviewees are elucidated. The research analysis is comprehensively discussed.

[part b] Results and analysis consist of four chapters organised around the research questions A, B1, B2, C and D. Chapter 5 Packaging design practice presents research data regarding interviewees’ perceptions on their roles and responsibilities, as well as their involvement and interactions with others within design situations. It thus identifies connotations given to design practices within organisations and the three main concepts generated out from such data are discussed. A summary of the data analysis in relation to research question [A] is presented. In Chapter 6 The idea of packaging and its validation, two sets of interview data around the current role of packaging and aspects that influence its configuration according to interviewees’ perceptions are presented. Concepts generated from these sets of data are introduced and discussed. A summary of the data that gives answer to research question [B1] is presented. Chapter 7 Packaging: sustaining the unsustainable? presents interview data on interviewees’ notions of packaging ‘success’ and packaging sustainability, explaining how assumptions around the former influence interviewees’ decisions on the latter. The concepts generated from this set of data are presented and discussed with the intention of addressing question [B2] from the research questions. Correlations from the concepts developed in Chapter 6 and Chapter 7 are made here. Chapter 8 Sustainability: option or necessity? presents the results and discussion from issues concerned with the structure of the industry and its influence on the realisation of packaging sustainability. They include interviewees’ trade-offs, bargaining processes and obstacles within design practices; tools and information used; and, finally, challenges for the industry in packaging sustainability as perceived by interviewees. The concepts generated are then presented and discussed; they relate to research questions [C] and [D].

[part c] Discussion and conclusion is the final component of this thesis, consisting of one chapter outlining the conclusions of the research by giving answer to the five research questions. Chapter 9 A transition to packaging sustainability focuses on the discussion of
the previously reviewed and analysed research questions [A], [B1], [B2], [C] and [D] by bringing them together in a way that forms a body of theory. This is presented as a progression of hypotheses that offers answers to question [E], the concluding research question concerned with how the essential transitions required in both design practice and within industry are to be realised. Future directions of the research are also proposed. The research outcome is presented in the form of a framework, offering recommendations for the essential transformations required in both design practices and the food and beverage packaging industry context in order to better position the role of design in packaging sustainability.
Chapter [2]
Elements and paradigms of design practice

As explained in Section 1.5, the relevance of the literature review in GT lies in providing the theoretical background and setting the context for the research based on what emerges in the research data. The literature review identifies the issues that the thesis is addressing, however, it is not intended to be an exhaustive survey of theory on the area of study and should not guide or validate the research outcome.

The literature review is divided in two chapters since the area of research intersects with two major areas, i.e., design practice and packaging sustainability. Chapter [2] presents a discussion on elements and issues of design practice, particularly based on industrial and product design literature. Literature on food and beverage packaging industry and sustainability is discussed in Chapter [3]. This chapter is subdivided into five sections, as follows:

Section 2.1 presents definitions and assumptions on the character and meaning of design emphasising how the context of practice is relevant in defining its character. Two main distinctions of the character of design are discussed: first design as a problem-solving activity, and, second, as a problem defining activity.

Section 2.2 revises key moments in history that led to the emergence of the design profession and its setting within organisational contexts. It provides a review on how the role of design has evolved through a brief historical review of design practices within organisations distinguishing the internal and external issues that influence it.

Section 2.3 reviews two main paradigms in design: the rational and linear paradigm and the reflection-in-action paradigm. It compares the correspondent approaches to the role of design, design problems and design processes.

Section 2.4 presents an overview of key moments in history that established the preamble for including issues of sustainability in the design agenda. The distinction between a subset of concepts of sustainability that includes ‘eco-design’/‘design for the environment’/‘environmentally conscious design’ and ‘sustainable design’/‘design for sustainability’ are reviewed here.

Section 2.5 notes how the notion of design transformed over time and has been challenged in the literature: from being the creator of beautiful objects in the Industrial Revolution to being an agency of change for sustainability.
2.1 Characterisation of design

In exploring the role and practice of design, it is fundamental to understand the character that has been given to design throughout its history to avoid reducing it to simple definitions and assumptions of what is meant by ‘design’. This highly complex task is an unavoidable one before posing any serious questions on the social, environmental and ethical implications of design, which are of central importance to this research.

Over the past half-century, the theory and practice of design has evolved and the role of design has undergone significant transformations, in both its meaning and purpose (Julier 1993). Many attempts to provide an appropriate definition of design have been made in countless essays, journal papers, conferences and publications; yet a prevalent ambiguity remains in how the concept ‘design’ is understood among people as well as among design practitioners (Greenough 1952, Alexander 1964, Archer 1979, Dlnot 1982, Fry 1988, Cross 2001, Dorst and Cross 2001, 2006, Julier 2005, Margolin and Margolin 2002, Munari 2008, Papanek 1972, Schön 1984, Tischner and Charter 2001). It has been argued that such characterisations have often resulted in paradoxical and mystified perceptions of design. Changes in the perception and use of the term ‘design’ and changes in design practice are, precisely, a major factor contributing to the increased complexity in defining design.

According to design historian Daniel Fallan, one of the most critical aspects of design as a field is the many points of inherent ambiguity related to the

essential tension between ideology and practice, between mind and matter, between culture and commerce, between production and consumption, between utility and symbol, between tradition and innovation, between the real and the ideal (Fallman 2008, p.viii).

Some design historians state that the activity of designing has been carried out for as long as civilisations have existed (Fry 2005, Julier and Moor 2009, Fallan 2010), while others associate the beginning of design with the technological developments brought about by the Industrial Revolution in 1750 (Ponte 1990, McDermott 1997). Notions of what design entails are still ambiguous as to whether it refers to “a process (the act of designing), to the results of that activity (designed objects and images), or to a value [...]” (Dlnot 1984a, p.3). One thing, however, that seems to be clear in all of the conceptions of design, from its beginnings, is how designed products have been firmly embedded in consumer culture. The motives, intentions and practice of design have intrinsically been influenced by the
cultural, social and economic models during different periods of time. Margolin remarks that design is defined by the social setting in which it is practiced:

most attempts to develop theories of design have focused on refinement of methodologies rather than on an analysis of how design operates in society. Theorists have tended to look at design ahistorically, likening it to a science, whether natural or artificial, rather than to a social practice that is defined by its historical results (Margolin 1989, p.6).

Will Murray (2000), in reflecting on how societies are subordinated to changes in economic models and how that, in turn, influences the role of design, asserts that economic models are fundamental drivers for major changes in societies. They have also changed the meaning and purpose of design. Figure 2.1 summarises the prevalent economic models throughout the history of humanity from the Industrial Revolution to date.

![Figure 2.1 Influence of economic models in changes of the role of design within society](source)

As shown in Figure 2.1, the industrial economy of the Industrial Revolution dominated the world for over 200 years. With the beginning of the twentieth century a consumer economy was established driven by consumer demand through to the 1950s. In the following 25 years, a knowledge economy dominated focusing on the production and management of knowledge in which knowledge as such was a product. Around 1975, another economic model emerged based on human well-being consisting of material and nonmaterial goods. The historical transition from one economic model to another has had many repercussions on basic conditions of human life; including issues of
environmental sustainability (see Section 2.5). The human economy period as shown with question marks is still current.

The growing use of technology, during the Industrial Revolution of the eighteenth century, allowed for the introduction of improved manufacturing processes and availability of materials shipped from distant places to a centralised factory (Asimow 1962). The nature of production techniques was transformed whereby the mass-production of goods became possible and design had a major role in the creation of products that were unavoidably endowed with social significance through their consumption (Riccini 1998). During the 1800s, the term ‘design’ was associated with a variety of interrelated skills: from fine art and craftsmanship to artistic invention as well as architecture and engineering (Sparke 1983). The changes in production methods and society that occurred between the pre-industrialisation and the post-industrial eras also conditioned the role of design (Perks et al. 2005).

Dilnot (1984b, p.139) asserts that many connotations have been indiscriminately given to design either in terms of “the results of the design activity (designed products) or the problems which originate from that activity or both”. He remarks, however, that if design is looked upon in such a way, then the design process is disconnected from that notion, resulting in

ambiguities in formulations such as design-and-society as to what is meant in a particular formulation of the term (Dilnot 1984b, p.139).

In its most basic sense, the term ‘design’ has been used indiscriminately as both a verb and a noun. As a verb, it has commonly been thought of as a ‘problem-solving’ activity, i.e., ‘designing’. As a noun, it has been regarded as the ‘solution’ to that problem, i.e., the ‘designed’. Dilnot explains further the dual character of the term and discerns that it is precisely in trying to define it in such a simplistic way that the inability to embrace a more appropriate portrayal of design resides,

‘Design’ is a term ‘which is a noun and a verb, and also one which denotes a form of representation, an activity, a practice, a product, etc., at one and the same time’, and its public explications, the neat formulas (design is...) which at one and the same time both ‘obscure the immensely complex and varied division of labour at the basis of any productive activity’ and prevents adequate formulation of what design as a generic activity is or is characterized by (Dilnot 1984b, p.140).
Norman Potter (1969), in his book *What is a Designer?: Things, Places, Messages*, attempts a more pragmatic definition of design and explains that without reference to any specific context, the term ‘design’ is ambiguous. Potter (1969, p.13) argues, “every human being is a designer” as everyone has planned something at some time; yet he also points to the use of the word ‘design’ as the product of a plan conceived in the mind: as product design (things); as environmental design (places) and; communication design (messages) (Potter 1969). Along similar lines, Papanek asserts that,

\[
\text{All men are designers. All that we do, almost all the time, is design, for design is basic to all human activity (Papanek 1972, p.3).}
\]

On this he elaborated, arguing that inherent to human activities is

\[
\text{the planning and patterning of any act towards a desired, foreseeable end […] (Papanek 1972, p.3).}
\]

Furthermore, he states that design is

\[
\text{the conscious and intuitive effort to impose meaningful order (Papanek 1972, p.4).}
\]

Consciousness, he argues, is related to intellectualisation, rationalisation and analysis, whereas intuitiveness is a crucial element in design, in that sensing/feeling is part of the creative process that affects design, and it is that which brings to the surface ideas and thoughts accumulated at a subconscious level (Papanek 1972).

One could argue that the formulations of design listed above regard it as an end-oriented activity, determined by the assumption that design’s role is to produce realisable solutions in material form to concrete human problems. Along those lines, Victor Margolin offers a more inclusive view of design, by making a distinction between design and products:

\[
[...] \text{by ‘products’ I mean the human-made material and immaterial objects, activities and services, and complex systems or environments that constitute the domain of the artificial. And I intend ‘design’ to denote the conception and planning of these products. As I apply the term ‘products’ [...] I refer not only to the outcomes of professional design practice but}
\]
also to the vast results of design that everyone engages in (Margolin 1995, p. 89).

This definition underlines the difficulty of using one word to denote a wide range of quite diverse situations and to refer to all the people involved – both in the outcome of design decisions and in the activity of designing. Despite its appropriateness, this definition limits the understanding or the explanation of what design is or what phenomena design is concerned with.

2.1.1 Design as a problem-solving activity

Design has largely been regarded as a problem-solving activity. According to Asimow (1962), the design process is one of analysis and synthesis and in it, many decisions are made. That is not to say that all decisions hold the same weight or relevance. Yet, certain decisions directly influence other decisions made throughout the design process and, as a result, they determine the direction of the design ‘proposition’ or design ‘outcome’. Christopher Alexander defines design as

finding the right physical components of a physical structure (Alexander 1964, p.1)

Correspondingly, Herbert Simon (1969) asserts that design is a problem-solving activity concerned with the creation of the artificial. Yet, he takes on a fairly technical approach and emphasises that the field concerned with the creation of the artificial has been that of engineers. Design, he asserts, as well as engineering, is about how to make artefacts that have planned properties. Simon, therefore, emphasises that engineers are not the only professional designers, instead,

everyone designs who devises courses of action aimed at changing existing situations into preferred ones (Simon 1969, p.55).

This definition of design as a problem-solving activity has been widely used and while it fails in capturing the totality of what design involves, it is helpful to understand the phase models of the design process (Lawson and Dorst 2009). Simon’s (1969) mainstream theories in problem solving, which had their root in positivism, set the basis for the study of the design process as a linear one divided into two separate phases: problem definition and problem solution. A process is either an unintended or a planned sequence of actions or procedures which produces desired outcomes. It consists of a series of steps which are
performed through methods. A method is a way of doing something systematically through an orderly arrangement of specific techniques (Jones 1992). The starting point in the process is generally described as the definition of the design ‘task’ as specified in the design brief, which generally consists of a

description or list of all the factors, requirements and requests affecting product design (Heufler 2004, p.185).

Bazjanac (1974) argues two points of weakness in this ‘logical’ understanding of the design process: first, the sequence of thinking and decision-making is not a linear process; and second, the problems addressed in design do not correspond to linear analysis and synthesis (Figure 2.2).

\[\text{analysis} \rightarrow \text{synthesis} \rightarrow \text{evaluation}\]

\textbf{Figure 2.2} Linear process, design as problem-solving activity
\textbf{Source:} Lawson and Dorst (2009, p.28)

The main implication of Bazjanac’s critique is that design is looked upon either in terms of ‘problem definition’ or ‘problem solution’, and that the design contribution is seen in terms of a passive response to the task identified in the design brief or list of requirements made by a client (Dilnot 1982). This view of design, according to Dilnot, denies an understanding of what design really is, since it unavoidably disregards design as an active process.

Buchanan (1995) argues that ‘problem definition’ refers to the analytic phase in which ‘the problem’ or list of requirements is ‘given’ to the designer in order that they can establish all the design elements that could solve such a problem, and then propose a series of design concepts that fit those requirements. ‘Problem solution’ relates to the synthetic phase in which the design concepts proposed by the designer are assessed; one is selected, which subsequently becomes the ‘solution’ in the form of objects, products or systems.
2.1.2 Design as a problem-defining activity

In his search for an alternative to the linear, systematic model of design, Horst Rittel, a mathematician and former lecturer at the Hochschule für Gestaltung, stated that most of the problems that designers address are ‘wicked problems’\(^1\). In a general sense, wicked problems are defined as

> ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing (Rittel and Webber 1972, p.317).

In addition, Rittel and Webber assert that design problems, as wicked problems, have a non-definitive formulation and are therefore related to the formulation of a solution. Archer further explains this by stating that the ‘problem’ laid out in the design brief has little connection with the ‘design problem’:

> the problem in a design problem [...] is not the statement of requirements but obscurity about them. Nor is the ‘solution’ the means ultimately arrived at to meet the requirements (Archer 1979, p.18).

In other words, the problem lies in the fact that the problem in the brief is not appropriately defined, and thus the product becomes an inappropriate solution to this problem. Furthermore, Archer asserts that the solution should be

> a requirement/provision match that contains an acceptably small amount of residual misfit and obscurity (Archer 1979, p.18).

Archer (1968) concludes that the ‘design problem’ should be regarded as an ongoing clarification of the requirements, whereas, ‘design solutions’ should refer to balancing up the requirement and the provided solution. In this way, it is clear that design is regarded as an iterative process in which designers should have an active role in outlining the design brief through the clarification of requirements (Figure 2.3).

\(^1\) The term ‘wicked problems’ was first used by philosopher Karl Popper, yet, Ritter’s use took a different perspective.
Figure 2.3 Iterative process design problem-defining activity
Source: Lawson and Dorst (2009)

According to Dilnot (1982), this clarification process may generate an ‘improved brief’ which could potentially provide the design practitioner with the opportunity to better define the problem, and as a result, engage with its solution in a more appropriate way, transposing the common view of design as a mere fit to the given design brief. The clarification process produces what is known as a return brief, usually used in architecture. The return brief is a mechanism to communicate with a client after the submittal of the design brief, in order to set out the designer’s understanding of what is required and how to achieve it. In other words, the return brief is a process of negotiation.

From a more radical viewpoint, Fry (1988) argues that design is configured differently in relation to the varied discourses of its practice, presentation and economic exchange, which makes it difficult to come up with a single definition; however, implicit in all design is that it is a problem-defining activity (Fry 2004). Moreover, design denotes the human ability to

*prefigure what we create before the act of creation, and as such, it defines one of the fundamental characteristics that make us human* (Fry 2009, p.2).
Furthermore, he adds that

*while design actually embraces the totality of what something is and does, it gets seen to be purely appearance and performance* (Fry 2009, p.7).

Fry’s definition portrays issues of the symbolic activities that human beings employ in constructing and making sense of the world. It aims to underline the anthropological character that design holds, recognising that it carries elements of responsibility in its practice which other technical and operational definitions of design have failed to embrace.

Having discussed the nature of design processes and design problems, it is important to point out the distinctions between them. The most obvious is that between linear and iterative design processes, in which the systems of formulating a solution to a given design problem are fundamentally different: a linear framework imposes rigidity in the design process, focusing on finding a ‘fit’ to the problem; an iterative one allows for interaction between client and designer, in turn allowing for revision, understanding and the inevitable production of an appropriate outcome.

Different perspectives on definitions of design have been reviewed here, from those that characterise it in its most basic and pragmatic sense as a problem-solving activity; to those that understand it in relation to the results of the design activity or in terms of being a process; to more evolved views that see it in terms of its anthropological and intentional character; and finally to its status as a problem-defining activity (Fry 1988).

**2.2 Design within organisational contexts**

Organisations, as a means of coordinating a group of individuals to perform a set of activities required to achieve common tangible or intangible objectives, have been regarded as fundamental to modern societies as they provide products and/or services to satisfy human needs (Jones 1992, Morgan 1999). To successfully deliver value, it is necessary that an organisation is managed and regulated by structures (hierarchy), rules and values. Hierarchy within an organisation is defined as the classification of people according to authority and rank. An organisational chart is a drawing used to represent the organisational structure of a company where each role has a vertical and a horizontal dimension, as shown in Figure 2.4.
The process of assigning people and resources to tasks that allow for the effective achievement of the organisation’s goals is known as differentiation. Differentiation divides the organisation’s tasks into organisational roles, departments and divisions (Dunham et al. 1994). Types of organisational structures include divisional structure, functional structure and matrix structure and can be defined as follows (Crowther and Green 2004).

- Divisional structure is further broken down into three sub-types such as product structure, market structure, and geographic structure.
- Functional structure: based on functions performed (e.g., production, sales, research).
- Matrix structure: Based on a combination of function, product, customer and/or geography. Creates dual authority and dual responsibility.

In terms of structure, it has been found that organisations with horizontal differentiation may result in specialisation that limits communication between subunits and prevents
subunits learning from each other. As a result, people tend to perform their role strictly from the perspective of their subunit’s timeframe and objectives (Jones 1992). For example, someone within a role that delivers short-term outcomes will tend to take that approach, whereas someone with a role that delivers long-term outcomes will have a different perspective. When different functions see objectives differently, communication often fails and coordination becomes difficult, if not impossible. To avoid communication problems, organisations attempt to integrate functions. Integration is the process of coordinating various tasks, functions and divisions so that they work together (Jones 1992). There are many integrating mechanisms that can be used. The simplest mechanism is a hierarchy of authority and the most complex is to create a department that exclusively coordinates the activities of many functions or divisions. In more vertically structured organisations, such as smaller packaging consultancies, the levels of specialisation are lower and this integration is easier to achieve (Hampshire and Stephenson 2007).

The vertical dimension of the chart differentiates the organisational roles in terms of the authority between levels, which means that roles at the highest level of the organisation’s hierarchy have more responsibility than those at the bottom of the hierarchy, and authority over them. The horizontal differentiation refers to the division of labour and level of specialisation where highly specialised roles have a limited range of tasks and less specialised roles have a broad range of tasks. It is through an organisational chart that an organisation groups tasks and defines personal responsibilities in order to enable productivity (Dunham et al. 1994) (see Figure 2.4).

An organisational role has been defined as the “prescribed or expected behaviour associated with a particular position within a company” (Jones 2007, p.98). The term also refers to the set of tasks and activities assigned to or required of a person or group by the organisation they belong to. In Section 1.4, it was established that to give context to the research the focus centred upon the Australian food and beverage industry, some of the organisational roles of stakeholders involved in the design and development of packaging include marketers, brand managers, art/creative directors, industrial/product designers, packaging technologists/engineers and research and development professionals. The hierarchy and responsibilities of those involved in the packaging design process can vary from one organisation to another. The division of labour within organisations has been associated with economic growth; as such a division relies on people developing particular abilities and knowledge to perform specific tasks, which increases the productivity of the organisation. The degree of labour division must always be limited by the extent of the market (Jones 2007).
The role of design within organisations is still set to focus on the configuration of products (Figure 2.5).

As a direct result of the growth and industrialisation of the previous centuries, design has traditionally been considered as the creation or conceptualisation of objects of high aesthetic quality and this, by extension, included the designers, ideas, movements and institutions that conceive those objects (Walker 2006). Design's first promoters in the 19th and early 20th centuries, Henry Cole in England and Herman Muthesius in Germany, for example, saw the purpose of design as the improvement of the appearance of products by promoting a closer collaboration between artist and industry in relation to the manufacture of products for the market (Margolin 2002). On the other hand, design has also been associated with the arts and crafts and with the creation of beautiful and unique objects. Bruno Munari reflects that one of the main difficulties in defining design is to overcome the confusion and misconceptions of design seen as art:

> anyone working in the field of design has a hard task ahead of him: to clear his neighbour's mind of all preconceived notions of art and artists, notions picked up at schools where they condition you to think one way for the whole of your life, without stopping to think that life changes [...] (Munari 2008, p.25-26)

This confusion between design and the arts has its roots in the early years of the 20th century, when William Morris rejected mass-produced objects, arguing that they were ‘slavish’ copies of objects that were originally planned for hand production, and proposed a return to craft production. Morris’ objections to machine production were mainly an
ideological response to the Industrial Revolution and based on his beliefs that industrial activities brought alienation between designer and production, division of labour, deskillling and product standardisation (Julier 2005). Artists and craftsmen worked together with the common purpose of creating ‘beautiful’ objects – absent of superfluous decorations – in which a moral responsibility for providing a greater benefit was embedded (McDermott 1997). The unaffordability of these products of fine workmanship, the growth of urban centres and the rise of technology meant the end of the handcrafted Arts and Crafts movement and it was at this point that designers began to reconsider the value of mass production in the 1900s (Fuad-Luke 2009, Obniski 2008).

Interpretations of design moved back and forth between “ornamentation and standardization, between creative freedom and technical constraints” (Riccini 1998, p.47). Either design was understood as a maker of beautiful things, a mere ‘form giver’ concerned with the aesthetics of products; or design was ‘incorporated’ into production processes limited by technical constraints to resolve the functionality of products. Little consideration was given to quality standards or users’ requirements (Julier 2005). Thus, it was implied that there was a separation between planning and creative invention and the finalised product (Perks et al. 2005). These concepts preceded the origin of ‘modern’ notions of design in the 20th century, those of the Industrial Revolution, mass-production manufacture, the Modern Movement and consumer society (Julier and Moor 2009).

In the first two decades of the twentieth century, various design movements and groups such as Art Nouveau, Deutscher Werkbund and De Stijl, among others, emerged towards the creation of affordable, functional, aesthetic objects for everybody. It was around this time that design became considered a specialised skill, while simultaneously seen as an art. A dominance of functional, rational and efficient objects prevailed and the role of design moved into improving the lives of those using such products (Dormer 1993). By the 1920s, however, reactions to this practical approach emerged and the notion of ‘lifestyle’ was introduced to sell the idea of well-being through consumption of luxurious and decorative crafted objects (Julier 2005).

In the 1930s, a new practice emerged in the United States known as consultant design (Lockwood 2009). Among the designers working in American corporate and consulting firms were Harley Earl, Henry Dreyfuss, Walter Dorwin Teague, Donald Desky and Raymond Loewy. Their contribution lay in the main in developing methods by which design thinking began to serve the needs of emerging corporations. In the post-war years, American consultant practice became a model for industrial designers throughout the world as they sought to create a place for themselves in their respective national economies. It
continues to be influential in the context of the global economy (Margolin 1998). Design became a ‘catchphrase’, especially in marketing and the media: transforming ordinary products into exclusive, stylish objects (Walker 2004). Potter (1989) gave a functional classification that summarises the design practice that prevailed until the end of the 1980s within a given sector of professional work: impresarios, culture diffusers, culture generators, assistants and parasites. He explains further that:

*in small offices – or of course for independent free-lance workers – there will be little stratification; ‘the office’ may tend to move in one direction or another, but the work within it will be less predictable for any one member – excluding, perhaps, secretarial or administrative assistants and often temporary draughtsmen. A ‘consultant’ is often a lone wolf who deals in matters of high expertise or (paradoxically) of very broad generality. Designers will be found in every quarter; sometimes working independently, sometimes for government or local authority offices, or attached to large manufacturers, to retail agencies, to public corporations, and elsewhere in places too numerous to mention (Potter 1989, p.15).*

What is important to note in Potter’s descriptions is their relegation to the realm of history. Despite the evident, at least to designers, centrality of design in twentieth-century society, its significance is still not generally understood (Margolin 2002).

From the 1930s through to the 1960s, design was mainly driven by consumers; demand for streamlined and short-lived products, to the benefit of the manufacturing industry. Design took part in the global economic reconstruction post-World War II by promoting a consumer economy; this occurred predominantly through product obsolesce, by changing aesthetic aspects and shortening the functional life of products – a practice that still prevails today (Obniski 2008). Following World Wars I and II, and during the process of recuperation of a global order, the design and production of objects became a representation of cultural and social identities, that is, Italian, German, Finnish and Spanish design, among others, laying the foundation for design to be a vehicle of great influence in promoting the ideologies of nations.

By the 1950s, design was understood as a means for positioning organisations; its meaning was associated with a mix of concepts such as branding, competitive advantage, lifestyle, product differentiation, strategic design and fashion design (Bonsiepe 2006). Then, by the 1960s, as a result of cooperation between engineers and marketers, the role of design
branched out into product development, which was embraced by a consumer society. The ergonomic-oriented role of design of the 1970s represented a step towards user orientation. During the 1980s, product portfolio management or the management of companies’ product families, shifted design towards a more coordinating role. In the 1990s, a small but growing number of designers and design consultancies began to compete with management and consulting firms in certain areas of work. This competition came at a time when some leading management consulting firms were looking at design as a tool that could be incorporated into their own practices, either with or without a deep understanding of the nature of design (Buchanan 2008). Product branding was aimed at the design of user experiences – for example, the appearance of the product, the environment in which it was sold and its package had to be streamlined so that they could be used as branding tools. The latter has its foundation in the rise of management and organisation theory in the twentieth century in an attempt to improve the organisations’ capabilities and their effectiveness (Buchanan 2008). By the 2000s, the role of design had shifted towards global competitiveness and renewal. This may indicate a shift towards the design of organisations and practices, and away from the product. There was an increasing understanding that design should be undertaken from a broader range of perspectives which potentially could lead to organisational change (Buchanan 2008).

While notions of the role of design as a medium through which a vast material culture has been created are relatively recent (Dormer 1993); the purposes of design have had extreme consequences in our society and the environment in a very short period of time, whether intentionally or not. It can be said that the role of design has shifted considerably over the past few years, and it is now being recognised as a key business asset that can add significant value to products and services (Lockwood 2007). Perhaps the most obvious attribute of design within organisations is that it is perceived as to make ideas tangible, it takes abstract thoughts and makes something concrete. Another, sometimes less obvious, attribute of design is that it is human-centred. This focus on users ensures that solutions meet real needs, whether the users are fully aware of them or not. This pragmatic process of making ideas tangible and then trying them out with users means that design has a particular ability to make things simple. In the most advanced organisations, design is used at every level of the business from high-level strategy, helping to find new opportunities for growth, to detailed implementation (Design Council 2007).

The place that design occupies within organisations is better explained as ‘design management’. Design management has been regarded as the ongoing management and leadership of design organisations, processes and design outputs, that is, products,
services, communications, environments and interactions (Lockwood 2007). Gorb defines design management as

the effective deployment by line managers of the design resources available to an organisation in the pursuance of its corporate objectives. It is therefore directly concerned with the organizational place of design, with the identification of specific design disciplines which are relevant to the resolution of key management issues [...] (Gorb 1990, p.2).

Furthermore, he asserts that in large organisations, those who conceptualise a product are often not the same individuals as those who bring it into existence. A product concept may be developed in a research division and then transferred to a product division. However, even when the designers and makers are the same, the process still necessitates the involvement of many people from different professional backgrounds. Design has long been valued as a tool for organisations to adapt or re-orient themselves to external changes. However, in such a context it seeks to deliver cheaper and faster, improved products (Junginger 2008).

Design within organisations is also considered to affect gross margin performance through its contribution to a range of critical management issues which determine the nature and so the profitability of the product. These issues are many, Gorb (1990) points out three:

(i) product innovation in which design is the determinant in the amount of innovation and its rate of flow into the business;
(ii) quality which is best controlled by designing it in rather than inspecting it out; and
(iii) product range development where design has a key role in co-ordinating, simplifying and so promoting a product range. (Gorb 1990, p.4)

Design management falls into the three categories of integrating design into business, design for continuous development and design for improvement. Service organisations are characterised by their use of design consultants, the existence of design policy documentation and also the domination of the design function by marketing. Manufacturing companies, in comparison, are characterised by their use of internal design teams, a general absence of design policy documentation and the strong influence upon the design function of engineering. It has been suggested that while both sectors consider design to be equally important, the services sector views design as less accountable than the manufacturing sector (Dumas and Whitfield 1989).
Organisations need to manage internal business opportunities and activities and to do so they need to consider the economic life cycle in addition to including the ecological life cycle of their products and their packaging (James et al. 2005) (Figure 2.6).

The economic life cycle includes the consideration of issues such as selection of materials, design of packaging systems, distribution issues, sales, packaging use and end-of-life management, among others, requiring the involvement of different disciplines. Such disciplines include design, packaging technology, marketing, procurement, production, logistics and environmental management and legislation (James et al. 2005). The ecological life cycle comprises a series of successive and interconnected stages of a product/packaging system from raw material extraction, production, distribution, use through end-of-life management. In ensuring an optimal economic and ecological life
performance, the impacts of both the product and its packaging need to be considered concurrently (Lewis et al. 2002). Ideally, at the conceptual stages of packaging design the entire ecological life cycle should be considered.

2.3 Paradigms in design practice

Diverse debates emerged around different paradigms in design processes and in the understanding of design problems and design methods. The first attempts to ‘scientise’ design date from the 1920s Modern Movement of design. During this time, subjectivity in design dominated; during the movement, a desire to ‘objectivise’ and ‘rationalise’ art and design activities prevailed, resulting in attempts to establish a relationship between design and science (Cross 2011).

According to Dorst and Dijkhuis (1995) there have been two main paradigms which apprehend the design activity that represent two fundamentally different ways of looking at design. Implicit in conceptions of design is the sense that the design activity has values over and above those of the merely instrumental and designed products are endowed with these (Dilnot 1982). In the first, design is a rational and linear problem-solving process such as the one proposed by Herbert Simon (1969); the second, by Donald Schön (1983), describes design as a process of ‘reflection-in-action’. These paradigms correspond to positivist and constructivist approaches respectively (Figure 2.7).

![Figure 2.7 The rational problem solving paradigm and the reflection-in-action paradigms](image)

Source: Dorst and Dijkhuis (1995)
Criticism of Simon’s approach brought attention to the fundamentals of design theory, the logical form and status of design. It also highlighted a need for more comprehensive descriptions of the design activity rather than just the design (Dorst and Dijkhuis 1995). The most influential study of a designer at work has been that by Donald Schön. The influence of the study is largely due to its being set within Schön’s broader series of professional practice – across a diversity of professions – which he used to establish his theory of reflective practice, or how professionals think in action.

Despite the fact that many design theorists have attempted to provide an understanding of the relationship between science and design, some confusion still remains. This is largely related to looking at rational methods of incorporating scientific techniques and knowledge into the design process in order to make rational decisions (Bayazit 2004). The nature of design is such that it creates something simultaneously artificial and unique, and herein lies the problem when attempting to apply rigid scientific techniques.

Each paradigm is explained and discussed in the following two subsections: first, the rational and linear paradigm (Section 2.3.1); second, the reflection-in-action paradigm (Section 2.3.2).

2.3.1 Rational and linear paradigm

In the 1950s, in attempting to overcome his disappointment with the ‘superficiality of industrial design’, Christopher Jones engaged with the then newly-emerging discipline of ergonomics (Jones 1992). He aimed to address better users’ requirements through design processes, and in doing so carried out ergonomic studies of user behaviour. In order that the results of the studies were taken up by design firms, he attempted to validate them by using engineers’ design processes, trying to understand such processes, and eventually redesigned them “so that intuition and rationality could co-exist, rather than excluding each other” (Jones 1992, p.x). As a consequence, human requirements were given priority and machine (object) requirements were considered second when designing. Hence, Jones transformed design methods, based on the assumption that the modern, industrial design of the time was too complex to be based on intuitive methods.

Some years later, in 1962, Jones and Denis Thornley co-organised the first Conference on Design Methods in London (Cross 2007). The aim was to bring together people from

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2 The International Ergonomics Association (IEA 2010) defines ergonomics (or human factors) as “the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance” (www.iea.com).
different backgrounds – the arts and the sciences – both in individual and collaborative practices, with the shared interest of discovering practical applications for scientific methods and knowledge.

From a pragmatic standpoint, design methods are concerned with ‘how’ and defining ‘when’ things happen, and in what desired order. There are also many variables that affect outcomes, since logic and intuition interplay with one another. Two people can therefore use the same method and arrive at different outcomes. In light of this, the focus of the conference was on distinguishing correlations linking different creative activities, as opposed to concentrating on particular professions (Slann 1963). It looked to achieve an understanding of design methods functioning in a cross-disciplinary way in which a specific body of skills, language and experiences for defining and solving problems were brought together. This conference is commonly recognised as the starting point at which design methodology became a subject of study in the design field, and as the origin of the ‘design methods movement’ (Cross 2007).

Subsequent Conferences on Design Methods were held in Birmingham in 1965 and Portsmouth in 1967. Some of those who adopted the methods presented therein considered design to be a rational, explainable process; such views were intensified by the end of the decade, culminating in Herbert Simon’s The Sciences of the Artificial (1969), in which he proposed the development of a ‘science of design’ about the design process in universities. As a result, radical technologist Buckminster Fuller heralded the 1960s as the ‘design science decade’ (Cross 2011). However, in the 1970s, the pioneers of the movement evidently rejected design methodology and its underlying values. (Jones 1992) questioned the aims, goals and purposes of ‘designing’ in his book Design Methods: Seeds of Human Futures. In it, he set out examples of new proposed design methods for practitioners and students of design and planning, as well as for anyone outside design professions concerned with creative behaviour and technological change. In the 1992 second edition of the book, Jones clarifies that the aim of ‘new’ design methods was to address that which designers did not, as opposed to suggesting another way of doing design. Methodology goes further, by suggesting that preferred models are available for the definition of goals and the allocation of effort, and that if they are correctly employed, the designer’s work can be guided towards an optimum solution that might otherwise “have eluded him, except through the mediation of happy accident” (Potter 2002, p.59).

This discussion raises the key point that design methods constitute ways of doing. Before considering how to do design, it is first necessary for designers to find out what they are doing or what they should be doing, and from there, determine the ‘best’ way of doing it. Yet, what is also crucial to consider is that factors such as intuition and rationality affect the
result of a chosen design method; and therefore, two different people might not arrive at the same results using the same method.

Design methods are based on scientific methods, comparable to decision theory, and concerned with ways of doing something systematically through an orderly arrangement of specific techniques (Cross 2001). Simon Simon (1969, p.3) differentiates natural science from artificial science, identifying the former as “knowledge about natural objects and phenomena” and the latter as “knowledge about artificial objects and phenomena”. Furthermore, four key distinctions can be made:

1. Artificial things are synthesized (though not always or usually forethought) by human beings;
2. Artificial things may imitate appearances in natural things while lacking, in one or more respects, the reality of the latter;
3. Artificial things can be characterized in terms of functions, goal, adaptation;
4. Artificial things are often discussed, particularly when they are being designed, in terms of imperatives as well as descriptives [sic] (Simon 1969, p.5)

Simon’s (1969, p.113) proposition of a science of design was based on his belief that “the older kind of professional school” – referring to universities of the time – failed to educate for professional design at an appropriate intellectual level. He emphasised that the problem was based on the term “artificial science”, the related natural laws within and the natural laws without:

the artificial world is centered precisely on this interface between the inner and outer environments; it is concerned with attaining goals by adapting the former to the latter. The proper study of those who are concerned with the artificial is the way in which that adaptation of means to environments is brought about – and central to that is the process of design itself. The professional schools can resume their professional responsibilities just to the degree that they discover and teach science of design, a body of intellectually tough, analytic, partly formalizable, partly empirical, teachable doctrine about the design process (Simon 1969, p.113).

From this, it is important to note one thing: this interdisciplinary view of design sets a focal point for all those involved in creating the ‘artificial’, in which design is seen as any professional activity related to the solving of problems, and where the professional work of
“those called designers” can be synthesised (Simon 1969, p.113). From this view, design relates to synthetic (deductive) methodologies in which there have been clear efforts to understand design as an integrative discipline (Mahdjoubi 2003). Simon remarks,

the natural sciences are concerned with how things are [...] the designed, on the other hand, is concerned with how things ought to be (Simon 1969, p.114).

Cross, in an attempt to clarify Simon’s assertion, states that ‘method’ might be essential in science, as it serves as an instrument to validate results; in contrast, it is unnecessary in design practice as ‘results’ are not required to “be repeatable, and, in most cases, must not be repeated or copied” (Cross 2001, p.51).

2.3.2 Reflection-in-action paradigm

In his book The Reflective Practitioner, Schön (1983) offers an alternative model of the design process by proposing to tackle the ‘inadequacies’ in Simon’s model. He suggests a new paradigm, describing professional knowledge as a process of reflection-in-action or a ‘reflective practice’:

an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict (Schön 1983, p.49).

Schön openly disputed the positivist view of the “design science” movement, suggesting instead that a constructivist paradigm was more appropriate to define design practice. His main argument is that design problems are unique to a design brief, and that it is a fundamental skill in design to understand how they can be solved. He calls this the essence, ‘the artistry’ of design practice. Schön’s (Schön 1983, p.163) “reflective conversation with the situation” approach is useful in that it facilitates describing how the fundamentally unique problems of design are tackled. That is, he states that design problems are actively set or framed by designers, who then take action based on their understanding of the perceived current situation to improving it.

Schön’s (1983) work is influential to both designers and design researchers due to its accuracy in the analysis, despite the fact that it is was based on an incomplete design activity. The significance of the study relies on the accuracy of the observations and analysis of a real design situation. Schön (1984) was preoccupied with the idea that the
knowledge that design produces through its practice can be learned from textbooks. He was determined to develop a new ‘epistemology of design practice’ to explain how design practitioners engage in such a practice through knowledge that only can be translate by doing. He called such knowledge the tacit knowledge of design. It is further explained by Schön that the processes that take place in design practice are similar to those that take place when something is done by intuition. The most essential element here is that, like intuition, design knowledge cannot be externalised in language or a rational form. He argued that design practices are guided by intuition. Then, designing becomes ‘a reflective conversation with the situation,’ in which a back-and-forth thinking process occurs before ‘framing’ a problem. In the reflection-in-action paradigm, design partitioners confront a situation through three elements named ‘framing’, ‘making moves’, and ‘evaluat[ing] moves’. ‘Framing’ refers to the conceptualisation of a problem which requires setting up objectives. According to Schön (1983), it is the practitioner who ‘frames’ a way of addressing the problematic situation at hand. Once a problem has been framed, a process of analysis of the implications of possible solutions is undertaken, in what Schön calls ‘making moves’. A ‘move’ is a tentative design decision (Schön 1983). As the evaluation process progresses, further moves might be made. The relevance of the evaluation process is that it allows for reformulating the problem before actually engaging in a final solution since situations confronted are complex. However, this complexity might result in design practitioners ‘moving’ in inaccurate directions and decisions made need to be reconsidered. By reflecting back or ‘talking’ back the situation might be reframed and new moves need to be done (Cross 2001). Schön argues that given this separation of knowing from doing in the setting of design, means and ends are framed independently. Then, the significance of considering design as a reflective practice encompasses a vision of professionals engaged in conversation with their situation, based on their own frames and theories of action (Cross 2001).

The essence of Schön’s theory establishes that design practitioners are active in structuring and elucidating the problem, and they do not evaluate concepts, but rather how their own actions can contribute to solving the problem (Dorst and Dijkhuis 1995). This constructivist approach recognises action as the unit of doing design as opposed to the design concept phase which indicates that the focus should be put on designers ((Schön 1983). Through transaction with the situation, a practitioner “shapes it and makes himself a part of it” and “the sense he makes of the situation must include his own contribution to it” (Schön 1983, p.163). This concept has always been considered part of the professional knowledge of experienced designers and has not been considered describable or generalised in any meaningful way (Dorst and Dijkhuis 1995).
Schön’s great contribution has been to bring the notion into the centre of any understanding of what professionals do through the ideas of reflection in and on action. In the case of the former,

The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation (Schön 1983, p.68).

This distinction has been the subject of some debate; indeed he may well fail to clarify what is involved in the reflective process. Schön explained how practitioners have their own collection of images, ideas, and actions which they can use in other situations. He regarded these as the critical elements of reflective thought. To him, a design situation need to be understood; then, it becomes part of the partitioners’ repertoire. This is how practitioners are able to capture the essence of a situation. Even when it is not possible to fully understand a situation, it is possible to at least avoid making past errors. When confronting new situations, practitioners are influenced by that which they have encountered before. Schön insists that practitioners are able to use past experiences and knowledge into situations that adapt to the new situation, which results in new knowledge. However, Schön does not explain how practitioners are aware of this reflective process.

There have been three major areas of criticism with regard to this model that goes beyond its inherent rationality. The most important one has been done between reflection in and on action (Cross 2001, 2011). One key issue that, according to Cross (2001), Donald Schön oversighted is the issue of time. Time is an important factor in decision-making processes; if time is a constraint, then decisions may be compromised. If decisions are to be made in a very limited period of time, then practitioners’ ‘reflective process’ might be inadequate. One simply cannot be sure that, when time is a constraint, a process of reflection is overtaken. This is not to say that Schön’s views on practice are less significant; however, the lack of reflection in action might change the outcome. The reflection process is then subordinated to the issue of time. If practitioners are asked to describe their reflective processes, they might be able to articulate how they make use of the knowledge acquired through experience. It would be naive however to assume that such processes can be completely repeated since every design situation is different.
The significance of practitioners’ abilities of learning from experiences and bring past knowledge generated through reflection into new situations relies on the fact that such knowledge can be left and returned to. Then, it becomes clear that there are major discrepancies between reflection in and on action. One can talk with colleagues about these experiences and the knowledge gained on past situations; however, one cannot be certain on how such knowledge will be used in the next design situation. New questions will arise which cannot be answered until a practitioner is already in such design situation.

Paradoxically, another issue of Schön’s work that requires attention is the extent to which his conceptualisation of reflective practice can be transformed into action. There is a constant assumption that practitioners’ actions are reflected and informed in a particular situation. However, practitioners’ repertoire becomes more relevant in defining a situation as opposed to the way to approach a situation,

As practitioners frame the problem of the situation, they determine the features to which they will attend, the order they will attempt to impose on the situation, the directions in which they will try to change it. In this process, they identify both the ends to be sought and the means to be employed (Schön 1983, p.165).

The implications of the above is that imposing one’s knowledge and experience in framing a situation is what is clearly important. It allows for different ways of framing a situation and, therefore, different ways of approaching it. However, those different ways of approaching a situation are based upon practitioners’ individual experiences. The risk of the later is that if a situation is mistakenly framed, the ways of approaching or responding to situations might be inappropriate without the practitioners’ awareness of it. This is one major contribution of Schön’s work: that is, the capability of practitioners of identifying the means and the ends to approach situations that best suit their understanding.

While practitioners might be reflecting on their actions, they might have little or none consideration of the conditions around the situation itself and their circumstances around their own practice which ultimately inform and influence the way they frame a situation and the way to approach them. Schön’s little exploration on the situatedness of practitioner experience has been criticised (Cross 2001). The failure to attend to the issue situatedness in the development of his models and ideas has also meant that his contribution professional practice has been often used in a rather unreflective way by practitioners and educators.
Section 1.2 described how the increasing awareness on global environmental issues has grown in importance on the global agenda. Here, a revision on how design practitioners have inevitably been faced with the dilemma of whether or not to embrace them in their professional practices is discussed.

The terms ‘green design’/’eco-design’/’design for the environment’ (DfE) have been commonly used to refer to design strategies that minimise the negative environmental impacts of products within an economic framework/context, and have their foundation in engineering and life cycle assessment (LCA) principles. Dewberry and Goggin (1996) in their journal paper entitled Spaceship Ecodesign, identify a variation between green design and eco-design. The former focuses on a single issue, either materials or end-of-life management or energy consumption; whereas the latter adopts a lifecycle approach, exploring and tackling all of the greatest impacts across the product’s lifecycle. In their book Design + Environment, Lewis and Gertsakis note that divergences between green design and eco-design depend on the perspective they are viewed from, however, it is more relevant to realise that there is a common objective between them:

In essence, whether the process is referred to as DfE or ecodesign, the fundamental objective is to design products with the environment in mind and to assume some responsibility for the product’s environmental consequences as they relate to specific decisions and actions executed during the design process (Lewis and Gertsakis 2001, p.16).

Furthermore, they argue that an important approach is the one that integrates innovation and technology in order to achieve environmental and functional objectives and considering impacts across the whole life cycle of products and packaging. These include:

- Extraction and processing of raw materials
- Manufacturing of the product (and any associated packaging and consumables)
- Use or operation of product
- End-of-life options (e.g. re-use, remanufacturing, recycling, treatment and disposal) (Lewis and Gertsakis 2001, p.17).
The life-cycle or cradle-to-grave approach has been adopted largely to assess the environmental performance of existing products and to assist in making decisions related to materials and manufacturing processes.

According to Fry (1994), eco-design is a practice largely conceived of technical issues of product configuration, and has two directions that converge:

*it moves towards the creation of an economy that can produce while reducing ecological damage; while at the same time, it seeks to produce wealth while diminishing the volume of resources used* (Fry 1994, p.12).

Fry’s observations identify the dilemma intrinsically linked to the current system of production, which encourages increasing rates of consumption that inevitably become unsustainable, as a reduction of impacts on the environment is unattainable.

Principles of eco-design have moved forward, aiming to include not only the economic aspects and environmental issues of products but also issues of sustainability such as social concerns. This approach has been referred to as ‘Design for Sustainability’ (D4S) or ‘sustainable design’ (UNEP 2009). Such a correlation between design and sustainability has been the subject of debate due to confusion in its interpretation (Figure 2.8).

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**Figure 2.8** Design approaches to issues of the environment and sustainability

*Source:* Tischner (2005)
Generally, the concept of ‘sustainable design’ has connotations related to sustainable development and therefore, its scope is frequently understood as addressing the environmental impacts associated with products and packaging in balance with the economic and social issues (Thorpe 2007). Arguments have been made that this definition lacks consideration of the ethical issues derived from production and consumption patterns. For instance, Stuart Walker explains D4S as a process that requires the redesigning of human habits, lifestyles and design practices, including the way design is thought about, offering his understanding of sustainability and its correlation to design as:

*a fluid, dynamic, unfocused goal and this is how it has to be; any attempt to define a vision of a sustainable society will always fall short. Similarly, any one approach to sustainable product design will be incomplete [...] (Walker 2006, p.79).*

Others have interpreted D4S in the same pragmatic terms as eco-design: as a method or list of steps with the addition of social considerations (Maxwell and Van der Vorst 2003), while others make a distinction between environmental sustainability and social sustainability (Manzini 2007, Vezzoli and Manzini 2008). There are other attempts to advance the discussion by moving away from preconceived ideas of what design does, instead exploring what the relationship between design and sustainability may be (Margolin 1998, Tischner 2001, Walker 2006, Fry 2009). Lewis and Gertsakis (2001) assert that

*sustainable design begins to address the bigger picture by considering collectively some of the harder questions, such as need, equity, ethics, social impact and total resource efficiency and thus the role of design in achieving inter-generational equity (Lewis and Gertsakis 2001, p.19).*

In understanding the discrepancies between the notions and concepts of ‘sustainable design’ and ‘design for sustainability’, it becomes important to consider two particular elements: the former focuses on the impacts that human activities have on the environment; whereas the latter is concerned with how human activities impact on the needs of a society in the long-term by challenging the ethical motivations of such activities in relation to issues of justice, equality and ecology.
The distinctions made here allow for an explanation of how concepts are used throughout the research. The term ‘sustainability’ has been chosen over ‘sustainable development’, because the former allows for balancing and integrates ethical, social and environmental issues and embodies greater diversity and flexibility in the ways of addressing such issues without predetermined agendas as opposed to the prescription of certain types of change subordinated by pre-established economic objectives. The variations of the concept in this research are:

- ‘design for sustainability’ as opposed to ‘sustainable design’;
- ‘packaging sustainability’ as opposed to ‘sustainable packaging’

That is, the word ‘sustainability’ is used as a noun to encompass an idea as opposed to being an adjective that limits or qualifies a noun. The terms ‘sustainable design’ and ‘sustainable packaging’ are used only when they are the actual concepts used by other authors or interviewees.

2.5 Contesting the role of design in sustainability

For the last 50 years, the role of design has been reviewed by several design theorists calling for transformations in the practice of design, where arguments have been made asserting that the role of design is to address critical social issues, particularly those related to sustainability (Bural 1991, Fry 1992b, Bhamra et al. 1999, El-Haggar 2007).

Since the late 1960s, environmental issues resulting from human activities emerged as a public concern. A frequent approach to these issues was to reduce pollution and waste after something had been produced. The focus then moved to ‘cleaner’ manufacturing processes that aimed to reduce waste, pollution and toxic substances throughout production. In 1972, the idea of ‘responsible’ design: “design for people’s needs not for people’s wants” (1972, p.16), was introduced by Victor Papanek. He suggested that the main role of the design profession was of a social and ethical nature. A major argument of Papanek’s was that designers have widely disregarded the ‘genuine’ needs of people, including psychological, social and intellectual ones. Furthermore, Papanek made reference to designers as a “dangerous breed”, as in designing unnecessary things they are “partially responsible for all types of pollution” (1972, p.17). While Papanek’s critiques of the design profession set the preamble for many others in the field, many of which propose diverse approaches, at the time, these accusations resulted in controversy and provoked counter-criticism within the design community. However, according to Papanek
(1972), they also inevitably resulted in designers’ internal dilemma of whether to ‘design for need’ or ‘design for sales’. Papanek’s arguments are, in fact, oriented to the redirection of the ‘mainstream’ design practice towards one in which ‘useful’ products are created, ‘solving’ a need rather than creating one. Design practices, he proposed, should turn to the design of products for, among other areas, medicine, education, social equity and sustaining human life under marginal conditions. Also among Papanek’s proposed new practices were working with developing countries to create products using little technology, designing for the disabled, and creating new goods that balance growing environmental problems.

In her book Green Design: Design for the Environment, MacKenzie (1991) identified through the use of practical examples, the role of architecture and design in minimising the environmental issues of buildings and the manufacturing of products and their packaging. The relevance of this publication rests on MacKenzie’s pioneering remarks on the industry’s need to undertake a ‘design-to-product’ cycle approach in order to overcome the environmental impact of their processes. MacKenzie’s final remarks, nevertheless, remained focused on manufacturing processes and end-of-life strategies, while no ‘constructed’ design proposition that guided or informed those involved in design practices was articulated.

In 1995, Papanek took his reflections further in The Green Imperative, stating that the ‘ethical’ role of design involves considering the environmental consequences of products, and he urged industrial design professionals and users to “recognise [their] ecological responsibilities” (1995, p.2). Once again, the designer’s ‘commercial’ practice is placed under scrutiny, emphasising the ‘complicity’ between designers and marketing professionals in producing and making available “unnecessary and wasteful objects” (Papanek 1995, p.17).

A more radical approach was taken in Biomimicry: Innovation Inspired by Nature (Benyus 2002), in which imitating nature’s principles in processes such as product manufacturing was proposed in order to minimise their environmental impacts. The book offered a list of ‘10 lessons’ to transform human industry practices through ‘ecologically intelligent design’. While the ‘lessons’ proposed are a good reference for understanding such principles, there is an implicit assumption that industry activities are comparable to those in nature. Learning from nature’s self-sufficiency within its own limits, would seem more relevant, as this goes back to reconsidering the way products and services are initially conceptualised. Furthermore, understanding that the creation of more products should not be justified under the argument that industry activities imitate natural principles is fundamental.
By 2002, the Cradle-to-Cradle approach had been introduced by architect William McDonough and chemist Michael Braungart (McDonough and Braungart 2002). Its major proposition was that “waste equals food” as in nature: products might take the form of “technical nutrients” after their useful life. In that way, rather than recycling materials, they could be put back into a continual closed-loop in industrial processes, just as nutrients are continually put back into the soil in nature. While the proposition seems to be ideal in theory, it has major implications in reality, as it would be viable only for specific products and only for a limited time. This principle shares the same flaw as Benyus’ earlier approach: it assumes the need for more products. In addition, it disregards the complexities and interdependencies of the nature of this system, such as users’ engagement.

The Eco-design Handbook (Fuad-Luke 2002), a well-known reference among designers, offers a huge variety of examples of companies, across different design industry sectors, incorporating eco-design strategies and ‘eco-materials’ into their products. In addition, the publication provides a comprehensive list of eco-design terms, strategies, materials and suppliers as well as useful eco-design-related websites. It clearly illustrates products, the materials used and the aspects of production improved such as manufacturing or end-of-life management. The focus, again, remains highly product-oriented, disregarding the ‘real’ contexts and their complexities in terms of the design of the products.

Green design/eco-design resources and approaches have certainly facilitated a reduction of the environmental impacts of products. UNEP programs such as Design for Sustainability (UNEP 2004, 2009, Crul and Diehl 2006) promote the use of design and other product-related interventions within organisations in order to engage with practices of consumption and production considering issues of sustainability. It seems, however, that for design to have a significant role beyond creating ‘eco’ or ‘sustainable’ products, organisations and design practitioners need to recognise that design

“instead of simply making an object or a thing, is actually creating a persuasive argument that comes to life whenever a user considers or uses a product as a means to some end” (Buchanan 1989, p.95-96).

It has been discussed that a major constraint in this is that design is still regarded, by design practitioners and organisations, as merely concerned with issues of the appearance of products, and the resolution of technical and functional issue where issues of sustainability tend to be embraced in unstructured and isolated ways (Stegall 2006). There has been a recognition that contributions cannot be limited to products but need to start from human
needs and ways of living, looking for the most efficient ways to satisfy them (Fry 1994, Spangenberg 2002, Walker 2004). Design has become a “regulatory service between production and consumption [patterns]” adopted by ‘modern’ societies (Fuad-Luke 2009, p.36). Ethical and environmental considerations of products are still considered a separate issue, dealt with at the end of the design process, if at all.

Tony Fry (1994), in his book Remakings: Ecology Design Philosophy, asserts that this practice has allowed for the serving of an economy based on making more products, with the justification that it uses an environmentally sound material, manufacturing process and/or end-of-life management strategy. Furthermore, Fry (1994, p.28) emphasises that “the creation of a better understanding of a critical mode of eco-design as a new design paradigm” is required. Herein lays the fundamental point for understanding design as a contributor to sustainability: transcending the technical issues of product configuration and shifting to a more holistic view. Fry (2004) proposes that the role of design goes beyond creating the ‘environmentally improved’ versions of existing products since in doing so little is done to radically challenge our material culture. Instead, he suggests that the role of design is concerned with the elimination of the unsustainable. Fry asserts,

> Clearly such elimination requires an enormous design effort [...] The overall quantity of the unsustainable just has to be dramatically reduced. It is not a question of finding replacement but rather displacement. Likewise, many objects of desire have to be exposed to strategies for transforming them into the absolutely undesirable (Fry 2004, p.2).

Further, Fry (2004) remarks that elimination through design can be done through different approaches including dematerialisation and rematerialisation. Dematerialisation is, on the one hand, a design strategy that aims to provide a service that eliminates the need of creating new ‘environmentally improved’ products. The term dematerialisation derives from a design approach that aims at reducing material content of products (light-weighting). Since the mid 1970’s, successful examples of light-weighting have been found in consumer packaging. For instance, drink cans and bottles are dematerialised by reducing the wall thickness of such containers, driven by cost for the most part and made possible through technologic advancements. Rematerialisation, on the other hand, involves bringing technologies back that are less energy-intensive, less environmentally damaging machines, and work as a wellbeing activity. For example, reducing or eliminating health-related issues as a result of work in offices, factories or in farms (Fry 2004).
Walker suggests that design that is oriented to sustainability fundamentally requires the exploration of new design practices to fulfill human needs through propositions that are “fully aware of the new context in which we find ourselves and [that] learn to respond to it in an appropriate manner” (2006, p.9). He also challenges the traditional approach to the conception and design of products in industry in the last century and brings into the discussion the relationship between ephemerality, functionality and aesthetics. Moreover, Walker states that moving towards design sustainability, it is necessary to take on a different perspective, that is, to

challenge our understanding of ‘functional products’, by reframing our conceptions of products, and by reassessing our notions of product aesthetics (Walker 2006, p.3).

He implies that one of the fundamental issues in design is moving from preconceived ideas of what a product is to a more ‘critical thinking’ approach in the design process, which questions such ideas and then delivers “lasting, meaningful and, hopefully, more benign material culture” (Walker 2006, p.13). While Walker challenges design practices in general, he refers to an individual design practice that is undertaken independently from the organisational context. In this regard, Walker asserts that the role of design is restricted to responding to a brief, and he emphasises that design for sustainability requires a different approach:

Instead of trying to ‘force fit’ sustainable principles into an existing and often unreceptive manufacturing system, it may be useful to approach the subject from the opposite direction, and consider how functional objects might be [conceived.] designed and manufactured to be compatible with principles of sustainable development. This would allow sustainable concerns to be included from the beginning and could provide much needed direction for developing new models of production (Walker 2006, p.30).

Similarly, Ursula Tischner in Sustainable Solutions (2001) remarks that the design profession plays an important role in delivering more ‘sustainable’ solutions; but first, it is critical that designers recognise that role and understand the ‘real’ meaning of it. She argues that since designers are the ‘interface’ between the user and the product or service, design has a significant role in influencing the production and consumption of products, something which directly relates to sustainability. Furthermore, she emphasises that designers need to engage other stakeholders in the process to facilitate the dialogue and
understanding of all aspects involved in that process. Those responsible for generating and managing the process need to be aware of the sustainability issues of products before real change can be actualised (Tischner 2001). The challenge for design is to become an active and significant part in the initial phases of design activities and processes, as it is in these phases that an idea is conceived and later taken into a concept.

More recently, Tony Fry (2009) has taken on a more philosophical approach to design and sustainability in his book Design Futuring, whose central idea is the need to ‘redirect’ the design practice to engage with sustainability. Fry argues that while

\[
\text{design actually embraces the totality of what something is and does, it is seen to be purely appearance and performance (Fry 2009, p.7).}
\]

One of Fry’s basic propositions is to move the focus away from ‘environmentally’ designed products, since that does not necessarily guarantee a contribution to sustainability. Stegall (2006) in reviewing the notion of a sustainable product, asserts that the shortcoming of these strategies is that even if an organisation could design the most eco-efficient product and recycle it at the end of its useful life, the very idea of a ‘sustainable product’ is relative and possibly deceptive, since the effect

\[
\text{any product has on the social and ecological environment depends as much on its use as on the technology it deploys [...] The role of the designer in developing a sustainable society is not simply to create “sustainable products,” but rather to envision products, processes, and services that encourage widespread sustainable behaviour (Stegall 2006, p.56-57).}
\]

The impacts resulting from designing objects should thus be understood in relation to the context in which they are going to be found. Fry asserts, the approach should be to “develop new design practices that fully engage and acknowledge the implications of the designed” (Fry 2009, p. vii).

There are others who have suggested that the focus should shift from issues of manufacturing to concerns about how objects and products are consumed, used and disposed of. Those supporting this conjecture have suggested that while a product incorporates environmental considerations in the way it is produced; designers can influence behaviours through the proposed use of the product. Unsustainable behaviours may still bring detrimental social, cultural and environmental consequences (Woodham
1983, Ehrenfeld 2002, Stegall 2006, Buchanan 2008, Fry 2009). It has been suggested that strategies such as recycling and eco-efficiency become irrelevant if consumption increases (Ehrenfeld 1997).

In 2009, Nathan Shedroff published his book titled Design is the Problem: The Future of Design must be sustainable. This publication intended to appeal a varied range of practitioners involved in the design of products, services, experiences, events, and systems to engage in issues of sustainability. The book summarises a range of sustainability approaches such as Natural Capitalism, Cradle-to-Cradle, LCA, The Natural Step, and Total Beauty among others (Datschefski 2001, Berger 2002, McDonough and Braungart 2002, Lewis 2005, Sustainable Living Foundation 2005, Natural Step 2009). By pointing out strengths and weaknesses of these approaches, Shedroff, proposed to focus on influencing people’s behaviours and promoting sustainable societies through the consideration of ethical and environmental concerns, as an alternative way to minimise the impacts of consumption (Shedroff 2009). Others supporting the changing behaviour approach – which as a concept entirely focuses on how to resolve users’ needs in a more ‘sustainable’ way – have proposed to look at patterns of consumption, which are equally important as those of production in terms of sustainability, bringing a more human perspective to the debate (Remmen 2001, Tischner 2006, Walker 2006, Vezzoli and Manzini 2008).

Design theorists argue that design lacks meaning, transcending the consideration of isolated issues and short-term solutions and making it impossible to embrace sustainability principles. Stuart Walker points out that such traditional understanding of design have prevented design from

> evolving into an authentic, substantive discipline capable of effectively tackling the important issues of our time: the pressing contemporary concerns that are not being appropriately dealt with in product design and manufacturing are the ethical and environmental ramifications of our actions. […] there is also a need to generate solutions that defy current norms; that challenge convention; that re-conceive what design, production and products might be… (Walker 2006, p.6-7).

Thus, existing views of design seem no longer to be valid; the undertaking of a fundamental revision of current design notions and practices is needed to redefine major aspects of design, moving away from ‘traditional’ views before appropriately articulating the significance of design in sustainability (Papanek 1972, Buchanan 1989, Gertsakis et al.
Chapter [ 3 ]
The food and beverage packaging industry and issues of sustainability

This chapter reviews features of the food and beverage industry and issues of packaging sustainability.

Section 3.1 presents a brief review of historical and contemporary food systems and the origins of packaging to provide context regarding the development of packaging in its current role.

Section 3.2 introduces various definitions of packaging and discusses the evolution of the role of food and beverage packaging.

Section 3.3 gives an overview of the organisations pertaining to the food and beverage packaging supply chain.

Section 3.4 discusses elements of package design within the organisational context.

Section 3.5 describes issues of packaging and sustainability throughout the ecological cycle and focusing on environmental issues of the production, use and end-of-life management.

Section 3.6 presents the two major attempts for defining and guiding the design of ‘sustainable packaging’: first, by the Australian-based Sustainable Packaging Alliance, and second, by the US-based Sustainable Packaging Coalition.

Section 3.7 gives an overview of packaging related tools.

Section 3.8 discusses current packaging regulations in Australia.
3.1 The development of food systems and the origins of packaging

In early periods of history, people were self-sufficient in obtaining their food by way of hunting, fishing or gathering practices and it was consumed soon after that. As sources of food were extinguished, groups of people moved from one place to another in search of more food (Lewin 1996). The development of pastoral techniques by about 5000 B.C., allowed the establishment of more permanent human settlements based around farming (Larsen and Armitage 1977, Soroka 1996). While the need for containing, storing, and transporting foodstuffs has existed since ancient civilisations, it was from after this development that the earliest types of food containers were discovered. These early ‘packages’ are attributed to the need for ‘something’ in which to store and transport food excess. Items used as containers ranged from sacks, baskets and bags, as well as hollowed logs, woven grasses, wineskins and animal organs (Soroka 1996).

Since the rise of sedentary human civilization, farming remained the main activity for obtaining food and its consumption was largely localised. The community-based structure of the modern Western world developed from this time, and as such the forms of packages used today derive from the basic purpose of containment and storing food. As techniques continued to develop, other sophisticated types of packaging also emerged, for example, the use of metals and pottery. The discovery of hollowed-glass techniques facilitated the making of glass containers such as jars and vessels (Soroka 1996). On the other hand, the use of metals for food containment was uncommon as it was apparently regarded as poisonous (Berger 2002).

Packaging, in its current industrialised form, has its origins early in the 19th century when due to military requirements key packaging developments were made. In 1809, General Napoleon Bonaparte offered a prize of 12,000 francs to anyone who could come up with a method for preserving food for his army. One year later, Nicolas Appert developed hermetically sealed glass jars that were sterilized by boiling. While a range of methods for the preservation of food had already been used such as salting, smoking, fermenting and drying, this technique allowed the preservation of a wide variety of foodstuffs for long periods of time (Berger 2002, Blay-Palmer 2008, Coles 2011). An increasing demand for pre-packaged foodstuffs and food service packaging since then resulted in the development of a range of packaging materials and techniques (Coles 2011).

The Industrial Revolution period is significant in the history of packaging since it brought considerable changes in society and, as a consequence, in patterns of production and consumption of foodstuffs. The manufacturing changes, new technologies and production
processes of the Industrial Revolution influenced both the type and the quantity of products available, including within the food industry (Blay-Palmer 2008). By the early 1850s, these changes and the new economic system meant that food had evolved into an ‘industrial commodity’ (Winson 1992). Migration from rural areas into urban communities in search of work directly influenced the way food was integrated into new economic and production systems (Soroka 1996), in that they increased the demand for transporting this new ‘commodity’ into the cities. As a result, the connection between production and consumption began to disappear: people were increasingly separated from where their food was grown and people no longer dealt with farmers directly. Blay-Palmer (2008) remarks that food became an industry as a direct consequence of the food processing technologies of the Industrial Revolution:

> the emergent industrialization of the food process leads to an iteration between increased urbanization, growing distances between people and their food, and the scaling up of what will become the food industry (Blay-Palmer 2008, p.18).

The establishment in cities of permanent shops that sold grocery items increased, and they began competing with local markets (Gawith and Robertson 2000). Initially, these shops purchased a limited variety of items in bulk containers such as barrels and sacks and such items were located behind a counter. A sales person or grocer, as they were known, dispensed, weighed and wrapped in paper the items sold and, in the case of liquids, customers frequently brought their own containers (Stewart 2007). Food was sold generically, meaning that cheese was cheese and oatmeal was oatmeal. Occasionally, however, marks were made on the barrel or cask with a blackening brush or with a hot branding iron to show origin or manufacturer (Soroka 1996). Brand marks became associated with high quality and food manufacturers who owned these brands relied on the ‘honesty’ of the grocers in keeping the products fresh and delivering them in good condition to consumers (Han 2005). However, selling rancid, contaminated or adulterated food became a recurrent practice to increase profits. The international adulteration of food led people to require further reassurance about the safety and quality of the products they were buying;

> in Britain, this prompted the formulation of the Adulteration Acts of 1860, 1872 and 1875 as attempts were made to shield the public from unscrupulous food processors and retailers. These Acts emphasized the composition of different foods such as milk and other basic food items, and focused on food safety (Blay-Palmer 2008, p.19).
In addition, to overcome these issues, hygiene procedures, refrigeration and pasteurisation were introduced by the food industry as preventive measures. Along with such measures, food manufacturers required ‘something’ that ensured the origin of a product and its safe transportation through the distribution system. The production and consumption of food thus moved from a largely ‘localised practice’ to the ‘mass-produced’ pre-packaged food system, with the result of ‘mass consumption’ that we know today (Murdoch and Miele 1999, Haig 2006, Blay-Palmer 2008).

Producers began to rely heavily on the ability of a package to protect and contain their products for long periods of time (Pilditch 1961). The use of pre-packaged products led to the disappearance of the grocer resulting in the emergence of the self-service retailer (Calver 2003). The traditional market, where food is sold in its most original way: vegetables with stems and roots and hanging animal carcasses, is purged from the supermarket, where food is processed elsewhere and put into packages. The most fundamental difference between a traditional market and a supermarket is that in the former the store holder is the interface between the customer and the item to be purchased whereas in the latter the packaging of the items sold is the interface between the consumer and the product. The product is thus dissociated from the personality of any particular person selling it (Harrison et al. 2005).

As (Pilditch 1961) points out, by the early decades of the 20th century a ‘new’ commercial role of packaging was to sell the product it contained. He argues that the package became ‘the silent salesman’: the link between companies and consumers which was necessary to ensure a consumer’s purchase at the point-of-sale. Furthermore, packaging began to be considered a ‘marketing tool’. It was, and still is, used as a medium to ‘communicate’ the product’s attributes as well as the ‘brand’s personality and values’ (Calver 2003). In a similar way, branding in packaging design is considered as a means to facilitate the communication of the product’s values to consumers in a meaningful way (Stewart 1994). It is important to emphasise, however, that packaging can in no way stand on its own; it only exists providing there is a product to be packaged.

Until the 1960s, brands were largely considered to be the product manufacturer’s name, something which provided quality assurance to buyers. The self-service supermarket format started to become established and was characterised by the strategies adopted, including low prices, efficient logistical supply chains and low profit margins, among others (Mathlouthi 1986).
Packaging has been regarded as the process that maintains the quality of food products for storage, transportation and end-use (DEFRA 2006). It prevents quality deterioration and facilitates distribution and marketing. In the current industrial food system there has been an emphasis on trading food as a ‘commodity’, and as such it is in large-scale production (Roth 1981). It is precisely in this market economy context that the packaging of foodstuffs has become an ‘item of consumption’ produced in one place, traded in another and finally consumed elsewhere. Kingston (1994) argues that urbanisation, along with the growing distances between people and their food, has inevitably resulted in an artificial trading system of food, one which has created

an impersonal link in the food chain, in which food is processed, packaged, shrink-wrapped, stickered and shelved – alienated from its natural source (Kingston 1994, p.52).

The modern food system is controlled by organisations that manage the growth, processing and shipping of food around the world. Characteristics related to this trading system include centralisation; capital, labour and technology dependence; competition; the domination of nature; the increasing specialisation and narrowing of production resources; and the exploitation of resources which seems to privilege short-term over long-term sustainability (Leigh 2003). Modern pre-packaged food distribution systems play a role in the trading scheme in which a tendency towards vertical integration can be identified (Figure 3.1).
The perishable nature of some foodstuffs and issues related to food contamination before its consumption has been presented as fundamental and irrefutable reasons for the use of packaging. For the purposes of this research, it is important to distinguish that because of these factors, the packaging of food differs significantly from other product categories (Nip 2007). As such, packaging is viewed as a necessary by-product of a specific distribution system that exists between food production and consumption. Some authors argue that early reasons for packing foods were related to survival; containers for the storage and transportation of food such as sacks, baskets, and bags made from plant or animal materials were needed to lengthen the life of food products (Nip 2007).

In contrast, alternative food systems such as organic foods, fair trade and the Italian Slow Food movement promote the retention and protection of regional foods and small producers. These food-provisioning systems attempt to move away from more industrial food production regimes. In other trading contexts such as farmers’ markets, direct sales from food stands or locally supported agriculture, packaging in its current configuration does not play a function as the delivery and accessibility of food is decentralised and aims to be self-sufficient. It has been pointed out that in an attempt to mitigate the detachment between producers and consumers of food, “regional and seasonal food provisioning systems and concepts have been re-established in many European regions,
such as community-supported agriculture or Slow Food" (Tischner and Kjærnes 2010, p.26). Moreover, in this context the trading of food relies on the relationship between the farmer and consumer (Blay-Palmer 2008), removing the need for packaging. However, local and seasonal food systems have been contrasted with global food systems. The term ‘food miles’ was introduced by Professor Tim Lang, at the Sustainable Agriculture Food and Environment (SAFE), to describe the distances that food items travel from source through to consumer in an effort to promote locally grown food. The longer the distances travelled, the greater the environmental impact (Erlöv et al. 2000, DEFRA 2006, Blay-Palmer 2008). The problem with food miles is that it only refers to distance and does not take into account fuel usage or emissions generated (Harrison et al. 2005).

As discussed in this section, the role of packaging in society over the last 200 years has been pushed in a completely different direction by the current trade system: from its origins as a simple container for the storage and transportation of a product, it has come to be considered as a fundamental part of commercial activities in the food and beverage industry (Selke 1994, Soroška 1996).

### 3.2 The role of food and beverage packaging

In order to recognise the foundations of the current social, economic and environmental role and implications of food and beverage packaging, the terms ‘packaging’ and ‘package’ are differentiated here. The fundamental distinction between those terms ‘packaging’ and ‘package’ is that the former is the system of transporting goods and, the latter is the physical entity that contains the product (Robertson 2005). Packing, another related term, refers to the activity of enclosing an item/s in a package (Robertson 2009).

Packaging has been defined from many different perspectives. A multidisciplinary definition is given by the *Wiley Encyclopaedia of Packaging Technology* (1997), which states that

packaging is the science, art and technology of protecting products from the overt and inherent adverse effects of the environment. Packaging is the integration of elements of materials, machinery and people to erect and maintain barriers between the product and external forces.

As a socio-scientific discipline, packaging is concerned with the provision of goods in the best possible condition so that the intended use or consumption can be carried out
(Lockhart 1998). Paine and Paine (1992) argue that many packaging definitions emphasise a commercial orientation in that it is,

1. a co-ordinated system of preparing goods for transport, distribution, storage, sale and use;
2. a means of ensuring safe delivery to the ultimate consumer in sound condition at minimum overall cost (Paine and Paine 1992, p.4).

Similarly, from a marketing perspective, packaging has been considered

a techno-economic function aimed at minimising costs of delivery while maximising sales and, hence, profit (Paine and Paine 1992, p.3).

Lockhart (1998), on the other hand, explains that a package operates in three different environments: 1) the physical, 2) the atmospheric and 3) the human. Three packaging functions are performed in each of these environments: protection, utility and communication. Each function interacts with the environment in which it operates; this in turn results in a more complex interrelation when considering the combination of them, as the influence of one function in one environment may interfere in the interactions within the others. Evidently, the human environment refers to human interaction with a package, and the atmospheric to the influence of external, airborne factors that can lead to damage or decay. The physical environment, however, refers to material damage that might occur to the contents of a package as a result of vibration and shocks from movement during transportation; other possible damage might occur when stacking or storing packages in the retail outlet or at the place they are intended to be used (Lee et al. 2008). Understanding these environments and the nature of the food product is important for specifying the packaging requirements. In designing a food packaging system, physical components and operations must be integrated to prevent over-packaging or under-packaging in which a systematic approach that embraces the entire product system needs to be in place (Lee et al. 2008)(Figure 3.2).
A food packaging system may involve up to four levels of packaging which are distinguished according to the use of the product and its contents (Figure 3.3).

The container that directly holds the product is the primary package. That may be a can, bottle, jar, tube, carton, or any number of other types (Pedersen 1997). The secondary package can comprise outer wrappings that help to store, transport, inform, display and protect the product, and as such often contains the advertising element. It might also be a corrugated fibreboard box that contains a number of primary packages. The main
The fundamental role of food and beverage packaging is to deliver a product in optimal condition for its consumption. The basic functions that a package performs include containing, protecting, preserving and informing/communicating (Klimchuk and Krasovec 2006, Hampshire and Stephenson 2007). It also assists in meeting health and safety requirements, provides convenience and ultimately reduces the spoilage or damage of products along the supply chain. Generally, successful packaging is considered the one that meets the requirements of a product while minimising the economic and environmental impacts of both the product and its package. Table 3.1 illustrates the varied packaging functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>• Prevent breakage (mechanical protection)</td>
</tr>
<tr>
<td></td>
<td>• Prevent spoilage (barrier to moisture, gases, light, flavours and aromas)</td>
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<tr>
<td></td>
<td>• Prevent contamination, tampering and theft</td>
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<td></td>
<td>• Increase shelf life</td>
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<tr>
<td>Promotion</td>
<td>• Description of product</td>
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<td></td>
<td>• List of ingredients</td>
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<td></td>
<td>• Product features &amp; benefits</td>
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<td></td>
<td>• Promotional messages and branding</td>
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<tr>
<td>Information</td>
<td>• Product identification</td>
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<td></td>
<td>• Product preparation and usage</td>
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<tr>
<td></td>
<td>• Nutritional and storage data</td>
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<tr>
<td></td>
<td>• Safety warnings</td>
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<td></td>
<td>• Contact Information</td>
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<tr>
<td></td>
<td>• Opening instructions</td>
</tr>
<tr>
<td></td>
<td>• End of life management</td>
</tr>
<tr>
<td>Convenience</td>
<td>• Product preparation and serving</td>
</tr>
<tr>
<td></td>
<td>• Product storage</td>
</tr>
<tr>
<td></td>
<td>• Portioning</td>
</tr>
<tr>
<td>Utilisation</td>
<td>• Provision of consumer units</td>
</tr>
<tr>
<td></td>
<td>• Provision of retail and transport units</td>
</tr>
<tr>
<td>Handling</td>
<td>• Transport from producer to retailer</td>
</tr>
<tr>
<td></td>
<td>• Point of sale display</td>
</tr>
<tr>
<td>Waste reduction and recycling</td>
<td>• Enables centralised processing and re-use of by-products</td>
</tr>
<tr>
<td>and reuse of by-products</td>
<td>• Facilitates portioning and storage</td>
</tr>
<tr>
<td></td>
<td>• Increases shelf life</td>
</tr>
<tr>
<td></td>
<td>• Reduces transport energy</td>
</tr>
</tbody>
</table>

**Table 3.1 Typical functions of a package**

*Source: ECR Europe and EUROPEN (2009, p.7), EUROPEN 2011*
The most basic function of a package is containing the food it is meant to protect and this requirement is subordinated to the food’s size, weight, form, and shape (Powell 1956). That is, the rigidity of a package varies depending whether the food is solid or liquid. The property of protection is essential due to safety, health and quality issues: protecting food from physical damage, physiochemical deterioration, microbial spoilage and product tampering, and maintaining the nutritional value of the food (Bakker 2006). The degree of protection required is related to the stability and fragility of the food, the shelf life and the distribution environment (Batabyal 1999). In most food products, the protection afforded by the package is an essential part of the preservation process, where generally, if the integrity of a package is breached, the product is no longer preserved (Brown and Williams 2003). Informing and communicating through packaging are two functions that have been associated with labelling and branding, respectively (Fishel 2003). They have been recognised for enabling supermarkets to operate on a self-service basis since they provide information on the type of product, manufacturer, and place of origin, contents, weight and nutritional facts, ingredients, safety warnings, product preparation and use by date (Haig 2006). One aspect that has been largely used as a main benefit for consumers is the convenience aspect that packaging provides. Social changes and modern lifestyles, such as the nature and size of households, more women in the workforce, are a major driver for packaging convenience (Hine 1995). Such convenience can come in the form of product preparation and serving, product storage and portioning (Leigh 2003).

3.3 The food and beverage packaging supply chain

The value of food and beverage packaging has been defined by organisations in the packaging supply chain in terms of the contributions that it makes to society by improving the quality of life of people as well as the positive environmental impact of reducing food waste (Bowersox et al. 2002). The food and beverage packaging supply is becoming more integrated (Bowersox and Closs 1996). This is helped by new and much more efficient forms of distribution and logistics. It allows increasing control over the products and their use along complex provisioning chains, improved maintenance and life-cycle management, improved storage and ordering management, precision farming methods and so (Tischner and Kjærnes 2010). Currently in the food and beverage supply chain, there are different types of organisations involved in the planning, design and development of packaging including brand owners, design and brand consultancies, packaging manufacturers and end-of-life management facilities, packaging consultancies, and retailers (Bowersox et al. 2002, Stewart 2007) (Figure 3.4).
Organisations can be divided into two categories according to the type of hierarchical scheme and the division of labour among their members, i.e., larger and smaller organisations. In the former, the division of labour is more complex as more activities are carried out, while in the latter the division of labour is minimal, as one person or a few people are able to accomplish several tasks (Jones 2004). Larger organisations involved in packaging design in the food and beverage industry include brand owners, packaging organisations and material suppliers. Smaller organisations are comprised of packaging consultancies, product design consultancies and brand consultancies (Southgate 1994).

‘Brand owner’ is defined by the APCC (2010, p.52) as “a person who is the owner or licensee in Australia of a trade mark under which a product is sold or otherwise distributed in Australia, whether the trade mark is registered or not”. ‘Packaging manufacturer’ is defined as “a company that manufacturers or imports packaging materials” (APCC 2010, p.53). Some companies refer to themselves as packaging organisations. Consultancies provide expert advice in a particular area such as design, branding, advertising and corporate identity (Fishel 2008).

A brand owner has the option of having an in-house design team or outsourcing all design work. When they employ their own internal design team, the type of design work undertaken varies from largely technical or packaging-engineering activities to graphic design (Fishel 2008). The members of an in-house design team operating at any level of design competence have an advantage in terms of their immediate understanding of the product and the production techniques (Fiell and Fiell 2003). They are also likely to be in contact with suppliers, and have an established relationship with them and with other
team members, making dealing with a variety of on-going and new issues easier (Boylston 2009).

In smaller packaging organisations, such as packaging consultancies, product design consultancies and brand consultancies, the number of members is normally fewer than 15 employees. Due to their small size, their structure varies from having one independent design consultant, responsible for everything from dealing with clients to writing design proposals to the production of strategic design solutions (Ball 1995). While there are other structures where the tasks are divided among a number of roles such as packaging designer or designers, senior designer, as well as creative director and the director of the consultancy, it is interesting to note that when the marketing department of a brand owner chooses to re-brand packaging, it tends to approach an external design consultancy to carry out the design and the in-house design teams infrequently make up part of that process (Klimchuk and Krasovec 2006). Reasons for this are often related to the fact that they become too close to the product and its production, and it becomes more difficult for them to have a fresh approach, a problem which external agencies do not encounter. In-house teams are rarely briefed the way agencies are: they are not given the time or the resources to conduct research and explore the market as they are involved in many other aspects of the organisation’s activities (Klimchuk and Krasovec 2006).

3.4 Packaging design within organisations

Packaging design has changed over the past 60 years. In the late 1950s, packaging design started to be considered a design discipline (Fiell and Fiell 1999). Packaging engineering departments were established within organisations in order to develop the functional aspects of packaging. The importance of efficiency, in filling production lines and in cost, was emphasised (Berger 2002). In the 1970s, there was a shift, and dedicated packaging companies were established offering services including structural and packaging design. Technological developments also transformed the skills required for packaging, and meant that packaging design practices have changed slightly within organisations. Many design organisations have also increasingly broadened their range of services and now offer packaging design, including branding, as part of their portfolio (Nip 2007).

The design process is the initial stage of the product/package development process where the formulation of the ‘requirements’ takes place. Below in this section, the packaging development process within organisations is described, including the initial stage of such a process known as the brief. The design process typically involves a series of
different phases, of which each one helps to inform a wider decision process. A summary of the steps involved in the rational design process model is presented in Table 3.2.

**RATIONAL DESIGN PROCESS MODEL**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Design brief - a statement of design goals</td>
</tr>
<tr>
<td>2</td>
<td>Analysis - analysis of current design goals</td>
</tr>
<tr>
<td>3</td>
<td>Research - investigating similar design solutions in the field or related topics</td>
</tr>
<tr>
<td>4</td>
<td>Specification - specifying requirements of a design solution for a product (product design)</td>
</tr>
<tr>
<td>5</td>
<td>Problem solving - conceptualizing and documenting design solutions</td>
</tr>
<tr>
<td>6</td>
<td>Presentation - presenting design solutions</td>
</tr>
<tr>
<td>7</td>
<td>Design during production</td>
</tr>
<tr>
<td>8</td>
<td>Development - continuation and improvement of a designed solution</td>
</tr>
<tr>
<td>9</td>
<td>Testing - in-situ testing a designed solution</td>
</tr>
<tr>
<td>10</td>
<td>Post-production design feedback for future designs</td>
</tr>
<tr>
<td>11</td>
<td>Implementation - introducing the designed solution into the environment</td>
</tr>
<tr>
<td>12</td>
<td>Evaluation and conclusion - summary of process and results, including constructive criticism and suggestions for future improvements</td>
</tr>
<tr>
<td>13</td>
<td>Redesign - any or all stages in the design process repeated (with corrections made) at any time before, during or after production.</td>
</tr>
</tbody>
</table>

**Table 3.2** Summary of the steps involved in the rational design process model

*Source:* Design Council 1997

Generally, within brand owner and packaging organisations, the packaging of products and services is planned, designed, developed, manufactured and delivered by a varied group of professionals. To make a packaging design project work, it is critical to clearly identify its objectives, timeframe and budget. It is both convenient and practical to break down the development of the project into stages, and to create a project plan. This needs to be reviewed to determine how departments/individuals are going to be involved and what their specific roles will be (Stewart 1994).

An iterative design process typically involves a series of different phases, each of which helps to inform a wider decision-making process, which starts with the preparation of a brief (Figure 3.5).
Generally, designers work within a written design brief submitted by the marketing team of the food/beverage producer, brand owner or retailer, or by a client in the case of consultancies. Ideally the design brief should be shaped in conjunction with them (Roth 1990). The brief summarises what is required for the development of a product, such as functionality, form and usability issues, as well as performance and technical aspects. It also specifies any important constraints, environmental regulations and legal terms related to the product (Fiell and Fiell 2000). Environmental regulations apply where there is use of natural resources; energy and pollution resulting from the manufacturing process, and also involve the end-of-life management. It is important to ensure the decisions taken regarding environmental issues satisfy the requirements of the project and have clear deliverable outcomes. Once the brief is complete, the next phase is idea generation.

The idea generation phase involves several meetings with the client where eventually an idea is selected and concept development begins, commonly presented by sketches or models. It is at this phase that most of the environmental issues can be envisaged since it is here where specific material and technology choices are made (Heufler 2004). A life cycle assessment could bring light into what are the most critical environmental issues. After marketers or clients have agreed upon the direction of the packaging concept, it is developed in more detail considering all the requirements in the brief, and determination of components and materials is finalised (Hey et al. 2007). The process involves meeting marketing, manufacturing and financial requirements as well as environmental and
government regulations. Once a packaging solution has been selected, the detailed design phase starts where the chosen packaging solution is further developed by making and testing prototypes. The production and market implementation phase follows. Once the product is tested in the market, an evaluation phase is undertaken for future improvements (Griffin and Sacharow 1972).

In practice, organisations use a combination of approaches and tools to design and develop their products. In large organisations, the design and development process is generally a formalised approach with fixed milestones and gateway management, whereas in small organisations one or several people, working in an informal and more spontaneous manner, can carry out the activities of packaging design (Green 2003).

In the package design literature, it has been suggested that innovation generates consumer demand Schumpeter (1973), (DuPuis and Silva 2008, Han 2005). A useful definition of innovation is that provided by Schumpeter (1973), which refers to the most commonly recognised type of innovations, i.e., new products, processes, raw materials, management methods, and markets. The terms ‘product innovation’ and ‘process innovation’ have been used to characterise the creation of new or improved goods and services and improvements in the ways to produce these goods and services, respectively (Godin 2009). A product innovation involves the commercial introduction of a product that is new to customers. In packaging, innovation can be applied to materials, format, and processes among others. Organisations are increasingly investing on packaging functional innovation with an expectation of building upon consumers’ experiences. A critical perception of marketers and brand managers is that all aspects of package design should reinforce the brand essence of a product. Brand essence is the intrinsic nature of the brand’s identity.

Branding is identified as a means to recognise the producer, and thus the quality of a product. Yet branding went from being, primarily, a method of identification, to becoming a marketing device that is meant to both identify and reinforce a product’s values at the point of purchase (Dobon et al. 2011). A brand is defined by its presence in consumer society, by the product’s physical attributes and emotional connotations, and by how they relate to a consumer’s aspirations. As such, branding has become the means by which organisations differentiate themselves in the minds of consumers (Demaria 2000). Any change in the design of a package needs to be relevant to the essence of brand and based on consumers’ expectations (DuPuis and Silva 2008). Boylston (2009) asserts that innovation plays a very important role in package design. Current packaging design practices are however largely focused on ‘stylistic innovation’, i.e., new colour schemes,
new packaging formats, or typographic design. This approach to innovation can only allow addressing packaging environmental issues in a very limited way. Boylston (2009) argues then that innovation intended to packaging sustainability needs to focus on the ways a package and its functions are conceived. That is, innovation should focus on improving packaging functions that truly relate to the protection, use and conservation of the product (Bhamra 2005).

In the packaging industry, marketing decisions are greatly influenced by marketers who are primarily responsible for undertaking the market research before launching a new product. They must first identify the needs and wants of the determined target market. The goal of marketing is to create customer satisfaction by building value-based relationships with customers, in conjunction with other internal and external business units. The end result is the gaining of market leadership by understanding consumer needs and finding solutions of superior value, quality and service (Polonsky 2001).

Marketers claim that consumers demand a wider range of products and greater segmentation (by size or flavour, for example) within those products. In the packaging industry features such as convenience/speed, and prepared foods providing smaller/single-serve portions are in demand (SPA 2004a). This demand is being reflected in an increase in packaging per food unit, as convenience packaging goes beyond the essential purpose of preserving and protecting the product. Many factors such as lifestyle changes, greater product differentiation and competitive pressures are considered in the sales appeal and quality of retail packaging (SPA 2004b).

**3.5 Packaging in the context of sustainability**

Despite the social and environmental benefits that packaging provides, there is recognition from the food and beverage packaging industry of the impacts that packaging materials have on the environment. One of the most obvious issues of packaging is that most is designed for single use and that has been perceived as a major counterpart to override its benefits (Bhamra 2005). Despite that reuse and recycling have been increasingly used in packaging systems as end-of-line management strategies. An area of concern is that packaging consumes irreplaceable resources and consequently contributes to their eventual scarcity. The most used packaging materials in food and beverages products are paper/board (cartons and corrugated), which is the largest single packaging material, followed by plastics that include high-density polyethylene (HDPE); polyethylene terephthalate (PET); polyvinyl chloride (PVC); polypropylene (PP) and polystyrene (PS); metals (aluminium and steel); and glass (Chiellini 2008). Polyethylene was
one of the first plastics used widely for food packaging. Although plastics have been more widely used as food packaging materials in the past 50–60 years, new developments in plastics have helped to increase the usage. For instance bioplastics, which are biodegradable plastics from renewable resources, offer an alternative to petroleum-based plastics. One of the most popular bioplastics is corn-based PLA (polylactic acid) - recent development by NatureWorks (Ashby and Johnson 2010). Other corn starch biopolymer which can be used in a range of manufacturing processes through thermoforming, injection moulding, film extrusion and blow moulding as well as flexible packaging is known as Plantic. One of the innovations of this bioplastic is that it is water-soluble and compostable. However the issue associated with the use of biopolymers is the land required to grow and harvest crops and the pollution in the recycling stream (Boylston 2009, Demaria 2000).

Other concerns include damage to land and ecosystems through land use (extraction/harvesting), depletion of natural and non-renewable resources, air and water pollution and waterborne waste, energy use and so on (EPA 2000) (Figure 3.6).

Pollution generated by packaging is not limited to the materials that comprise the package and its manufacturing by-products. Each step of material development requires massive amounts of energy, and the energy burned creates significant amounts of air pollution (INCPEN 2003). The manufacturing of paper, for example, is extremely water-intensive; it ranks third in hazardous effluent due to the pulping and bleaching processes.

Figure 3.6 Issues of the ecological cycle of packaging
Source: EPA (2000)
Despite the physical evidence that packaging material waste and depletion of resources are significant issues of packaging sustainability; it is energy consumption which forms the most significant issue of packaging within its manufacturing cycle (EnviroWise 2002, EPHC 2010). Energy consumption occurs through manufacturing processes and energy required for transportation. A critical distribution or transport phase usually occurs between all the stages of the ecological cycle and can have a significant impact on the whole product’s environmental cycle (Lewis and Gertsakis 2001).

Some of the issues of packaging that attract less attention are those of the social type. For example the process of extracting raw materials and the operation of cheap labour in manufacturing plants in developing countries where these practices are common (Hanley et al. 2007). However, the focus prevails on the environmental issues that packaging materials bring about. Impacts that have received the majority of the attention in recent years are greenhouse gas emissions and waste associated with the disposal of post-consumer packaging materials with policies and government regulations implemented to deal with these issues.

Government standards for package design vary considerably from country to country; however, they provide a helpful starting point for design improvements (Boylston 2009). For instance, the International Standards Organisations (ISO) has developed a comprehensive set of standards for creating, managing and improving environmental management systems (ISO 2002). The ISO 14000 family standards aim to provide tools for organisations to manage their environmental profiles and improve their performance in this area.

Another example of government legislation, particularly for packaging, is the Directive on Packaging and Packaging Waste in Europe that requests organisations have to either take all returned packaging or to pay a fee for its collection and management (European Union 1994). The Duales System Deutschland (DSD) in Germany was created to recover packaging separately from general waste collection through a ‘green dot’ trademark licensed to companies that paid a fee based on the type and quantity of packaging used. Similar legislation has been adopted in other European countries. Approaches adopted to regulate packaging materials’ end-of-life management include taxes, levies and compliance with greenhouse gas emissions reduction targets, as well as compulsory agreements of product stewardship and the waste minimisation hierarchy, which encourages avoidance, re-use, recycling and energy recovery from materials (Lewis and Gertsakis 2001).
In Australia, as mentioned in Section 1.1, the Australian Packaging Covenant (APC) is the voluntary component of a co-regulatory policy to reduce the life cycle environmental impacts of packaging. The first goal of the APC relates to optimising packaging using resources efficiently to reduce environmental impacts without the detriment of quality (APCC 2010). In addition APC signatories are required to implement the Sustainable Packaging Guidelines (SPG) for design. The guiding principles in the SPG to evaluate new and existing packaging are:

- maximise water and energy efficiency
- minimise materials
- use recycled materials
- use renewable materials
- minimise risk of hazardous materials
- responsible sourcing
- design for transport
- design for reuse
- design for litter reduction
- design for consumer accessibility
- provide consumer information

As it can be noticed from the above list, the guiding principles of the APC have a great focus on material particularly at the later stages of the environmental life cycle. In contrast, in a document named Packaging for the Sustainability Agenda: A guide for corporate decision makers prepared by the European Research Council ECR Europe and EUROPEN (2009), EUROPEN (2011), the design considerations provided for each stage of packaging life cycle also consider issues from earlier stages. For example, it considers the use of sustainably managed raw material extraction; issues of the manufacturing process such as maximising effectiveness; and also issues of the retail context such as efficient stocking and display, and the recovery of secondary and tertiary packaging. Table 3.3 presents the design considerations of each stage of its life cycle.
3.6 Attempts for defining and guiding packaging sustainability

In Section 1.1, it was mentioned that a range of resources have been available to organisations over the last decade, aiming to provide support related to design, packaging and sustainability. It was also mentioned that there has been two major attempts to define ‘sustainable packaging’. In 2003, the Australian-based Sustainable Packaging Alliance (SPA) released a discussion paper elucidating some of the concepts that sustainable packaging involves. In 2005, the USA-based Sustainable Packaging Coalition (SPC) offered a vision aiming to address environmental issues of packaging materials throughout its life cycle. These two definitions aim to set a list of principles or strategies to guide decision-making processes in relation to packaging materials.

According to the SPA’s sustainable packaging principles, if packaging is effective, efficient, cyclic and safe, it will support sustainable development (Fitzpatrick et al. 2012). The SPA definition, if presented in the form of a framework for decision-making in the
design of sustainable packaging, emphasises four major themes, which are summarised below:

- Effective in delivering the functional requirements of packaging
- Efficient in its use of materials, energy and water throughout its life cycle
- Cyclic in its use of renewable materials, energy and water throughout its life cycle
- Safety for people and the natural environment (Fitzpatrick et al. 2012, p.47).

While this definition considers a variety of aspects in the whole life cycle of packaging, its focus is on the environmental issues surrounding packaging materials and their end-of-life management. It seems that the focus has been put strongly at the packaging development process and it encourages the use of an appropriate decision-making process. However, it points out that for the adequate implementation of the framework a comprehensive understanding of the function of the packaging components is needed. In addition, a sustainability strategy must be in place in which planning processes on how to market and position itself together with its brands and packaging products.

The Sustainable Packaging Coalition (SPC 2006a) published Design Guidelines for Sustainable Packaging aiming to provide a basis for education of sustainability considerations as they relate to packaging. The SPC definition also defines sustainable packaging in terms of how it performs across the life cycle and it clearly addresses the function and purpose of packaging:

A. Is beneficial, safe and healthy for individuals and communities through communities throughout its life cycle;
B. Meets market criteria for both performance and cost;
C. Is sourced, manufactured, transported, and recycled using renewable energy;
D. Optimizes the use of renewable or recycled source materials;
E. Is manufactured using clean production technologies and best practices;
F. Is made from materials healthy in all probable end-of-life scenarios;
G. Is physically designed to optimize materials and energy;
H. Is effectively recovered and utilized in biological and/or industrial closed loop cycles (SPC 2006a).

It provides a basis for education of sustainability considerations as they relate to packaging, and to help bring them into the mainstream of packaging development. It is
to be designed to be flexible and adaptable to the various needs of designers and the requirements of a diverse industry. It includes issues that go beyond compliance and reflects the integration of sustainability and environmental considerations into the packaging design process. It also provides an overview of sustainability, cradle-to-cradle design and the SPC’s definition of sustainable packaging. The SPC guide focuses upon the following strategies (SPC 2006a):

- Design sustainably
- Design for transport
- Design with environmental best practice
- Design with fair labour and trade practices
- Design with renewable virgin materials
- Design for reuse
- Design for recycling
- Design for composting

3.7 Packaging related tools

There are many tools for supporting design for sustainability. Their aim is to assist the design practitioners in managing packaging sustainability. Table 3.4 (p. 87) provides a summary of available tools supporting design for sustainability together with description data required to use them. The list of the tools is not exhaustive, as the availability, scope, nature and format of tools are constantly evolving. They are, however, the most commonly used in packaging design.
<table>
<thead>
<tr>
<th>FORMAT</th>
<th>EXAMPLE</th>
<th>DATA REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Cycle Assessment Tools</td>
<td>COMPASS</td>
<td>Data for a closed-loop system that takes into account raw resources, conversion, and end-of-life treatment and fate of the materials after use.</td>
</tr>
<tr>
<td></td>
<td>Gabi</td>
<td>All primary elements of packaging life cycle plus any secondary data supported by in-built databases.</td>
</tr>
<tr>
<td></td>
<td>Life cycle map</td>
<td>Details of materials processes, transport and end-of-life of a package.</td>
</tr>
<tr>
<td></td>
<td>PIQET</td>
<td>Data from all stages of the life cycle plus any secondary data supported by in-built databases.</td>
</tr>
<tr>
<td></td>
<td>Sima Pro</td>
<td>All primary elements of packaging life cycle plus any secondary data supported by in-built databases.</td>
</tr>
<tr>
<td></td>
<td>Walmart Package Modelling</td>
<td>Packaging material type, weight, transport distance and efficiency.</td>
</tr>
<tr>
<td>Packaging specific code of practice and design guidelines</td>
<td>Australian Sustainable Packaging Guidelines.</td>
<td>Answer to questions on design, marketing, materials, processes, supply chain, end-of-life, and function package.</td>
</tr>
<tr>
<td></td>
<td>Design Guidelines for sustainable packaging.</td>
<td>Packaging specifications and requirements for comparison with data in guidelines.</td>
</tr>
<tr>
<td></td>
<td>Envirowise guide-Packaging design for environment: reducing cost and quantities.</td>
<td>Packaging specifications and requirements for comparison with data in guidelines.</td>
</tr>
<tr>
<td></td>
<td>The guide to evolving packaging design.</td>
<td>Packaging specifications and requirements for comparison with data in guidelines.</td>
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</tbody>
</table>

Table 3.4 Packaging sustainability tools

3.8 Packaging regulation in Australia

As discussed in Section 1.1, government regulations globally has placed pressure upon the packaging industry as a whole to improve efficiencies and reduce the life cycle impacts of packaging material sourcing, production, converting, use, and end-of-life management. Here, a more in-depth discussion is given.

Global environmental issues which society face range from global warming and climate change, to the depletion of the ozone layer to species extinction and habitat destruction (Pira International 2004). In addition to government involvement, consumer awareness of issues such as personal health and consumer concern for animal and environmental welfare has increased (Mathlouthi 1986). In 2008, the Environmental Performance of Australia report prepared by the Organisation for Economic Co-operation and Development (OECD) set out the baseline for assessing future environmental progress and examined Australia’s environmental performance in three areas:
1. Implementation of environmental policies;
2. Integration of environmental concerns and economic decisions;
3. International co-operation on environmental protection.

(OECD 2008, p.11-12).

Some relevant recommendations from this report that could contribute to further environmental progress in Australia are presented as follows:

- further expand the use of economic instruments, assuring the more complete application of the polluter pays and the user pays principles for water, energy, and waste management;
- improve and expand corporate environmental and sustainability reporting, and increase the transparency of voluntary agreements with industry;
- continue to harmonise legislation and regulation and improve co-operation between Commonwealth and state/territory governments (OECD 2008, p.12).

The adoption of the National Strategy for Ecologically Sustainable Development in the early 1990s means that efforts were in place directed to Australia’s sustainable development policy agenda and meeting the challenge of integrating the practice of sustainable development into economic and sectoral decisions. Sectoral strategies consistent with ecologically sustainable development have been compiled for agriculture, forestry, waste, biodiversity and water. State and local governments share the main responsibility for addressing issues such as water, air and waste management, land use, transport planning and natural resource management. Further, packaging supply chain organisations need to consider additional issues that include government regulations, material and transport costs, new techniques and taxes (Erlöv et al. 2000) with respect to current and future packaging systems. Organisations need to manage competitive pressures, and the key influences upon the Australian packaging industry include:

1. Demographic and life-style changes which will see an increase in ageing population, single households, and smaller families that will have an influence upon the types of packaging used for products;
2. Technological changes where there is expected to be an increase in the growth in electronic and home shopping via the internet that will introduce new demands upon the packaging system;
3. Environmental issues will remain a major driver including litter and land filling, with the success of the National Packaging Covenant essential;

4. Consumer demands will force market segmentation allowing products to be packaged dependent upon the demands of a particular group (such as microwaveable products, salad kits, modified atmosphere packaging, pre-cut, pre-portioned, smaller ready to consume products); and

5. Supply chain management will require a quicker more flexible response throughout the entire supply chain with a willingness to share information and develop long-term relationships (PCA 2005).

As these changes occur, there are other obstacles and issues that need to be considered. For example, a balance needs to be reached between delivering a reduced amount of packaging and the increasing need to provide safe products, for example through tamper-evident packaging (Kassaye 2001). In other cases, the requirement to provide convenience foods in portion packs will increase the quantity of packaging per unit of food. Packaging consumption is driven by demographic, cultural and social factors (Jedlicka 2008), while the structure of the Australian packaging industry is greatly influenced by the market size and geographical location of Australia as an isolated and sparsely populated country (Krarup and Russell 2005). There is also a debate that the increasing range of packaging material being used is less compatible with the existing post-consumer recycling systems (Lindwell et al. 2003).

Organisations have increasingly been urged to implement producer responsibility and corporate social responsibility into the whole life cycle of products by the imposition of laws and regulations (PCA 1997). It has been already discussed in Section 3.2 that the role of packaging in the supply chain is to contain and protect the product as a minimum. The Australian packaging industry supply chain as a whole has adopted different approaches aiming to reduce production costs, increase supply chain engagement, improved ability to anticipate future risks and opportunities, and improved staff satisfaction. However, these efforts are being hindered by ongoing uncertainty surrounding the packaging industry’s efforts, data gaps, fragmented industry responses and evolving commercial considerations (PCA 2005).

The Australian Packaging Covenant (Covenant) (APCC 2010) is an agreement between organisations in the supply chain and all levels of government to reduce the environmental impacts of consumer packaging, achieved by:
- designing more resource efficient and more recyclable packaging;
- increasing recovery and recycling of used packaging from households and away-from-home sources; and
- taking action to reduce the incidence and impacts of litter.

Participation in the Covenant is voluntary; however, brand owners who decide not to become signatories or who fail to comply with the Covenant requirements are regulated under the National Environmental Protection Measure (NEPM), where the organisation sells its products (APCC 2010).

The Covenant is based on the waste hierarchy, where it puts high priority on avoiding and minimising packaging waste, followed by reuse, recycling, recovery and finally, disposal. Signatories to the Covenant acknowledge that packaging has economic and social benefits, which include the containment, preservation, protection, marketing, distribution and branding of goods. They also agree to work together to implement and promote the principle of product stewardship for packaging. This means that responsibility for managing the environmental impacts of packaging is shared throughout the supply chain (raw material suppliers, packaging manufacturers and suppliers, brand owners and retailers) and by consumers, waste service providers, recyclers and all levels of government (APCC 2011).

The objective of the Covenant (APCC 2011) is to minimise the overall environmental impacts of packaging by pursuing these three performance goals:

- Design: optimise packaging to use resources efficiently and reduce environmental impact without compromising product quality and safety.
- Recycling: efficiently collect and recycle packaging.
- Product Stewardship: demonstrate commitment by all signatories.

This Covenant Schedule sets out the minimum requirements for action plans and annual reports. Action plans set out how a signatory intends to implement the commitments it makes under the Covenant, and how it intends to measure and report on progress. An annual report demonstrates progress in implementing the specific elements of its action plan, and shows the organisation’s contribution to achieving the objective, goals and targets set out in the Covenant.
Chapter [ 4 ]
Research method

The research approach and the use of Grounded Theory were introduced and briefly discussed in Section 1.5. In this forthcoming Chapter, the methodological procedures undertaken in this research are discussed.

Section 4.1 delineates the relationship between theory and research, in which the former is situated as the outcome of the latter.

Section 4.2 explicates the inductivist character of the research, to then depict the interpretivist and constructivist assumptions underpinning the research. Reasons for selecting a qualitative research strategy are given.

Section 4.3 establishes the suitability for selecting the Grounded Theory (GT) method for collecting and analysing data. The various stages of the process are explicated. The two different approaches within the GT method, the Glaserian and the Straussian, are briefly outlined. The former was chosen and this choice is later justified, followed by a discussion of the suitability of using the Glaserian GT.

Section 4.4 briefly discusses the methodological rigour and validity of the research based on the Glaserian GT approach.

Section 4.5 describes the use of a series of interviews as the primary data collection technique, emphasising how this enables an investigation of the ‘social reality’ of those being studied. The content of the interview schedule is then presented, with a description of how it relates back to the research questions.

Section 4.6 addresses potential ethical issues resulting from conducting interviews and the ethical guidelines are explained, including informed consent, confidentiality issues, and consequences for interviewees.

Section 4.7 includes an explanation of how the interviews were conducted, which issues were considered and which were disregarded.

Section 4.8 explains the interview procedure.

Section 4.9 describes issues surrounding the transcription of the interviews.

Section 4.10 concludes with a discussion of the analysis of data, explaining how the concepts discussed become a theoretical framework.
4.1 The theory-research relationship

The term ‘theory’ has been understood in a variety of ways. Bryman (2008) suggests that a common meaning attributed to theory in social research is “an explanation of observed regularities” (Bryman 2008, p. 6). Theories allow for organising knowledge in a logically constructed manner. A more comprehensive definition of theory refers to it as

\[ \text{a set of logically interrelated propositions, presented in a systematic way, which describe and explain social phenomena (Sarantakos 1998, p.10).} \]

Theory and research are directly interrelated (Sarantakos 1998, Bryman 2008). On the one hand, theory validation\(^3\) is often the starting point for research, since it allows for the making of basic assumptions and provides a framework through which research findings can be interpreted. Research, then, provides a way to validate a given theory (Sarantakos 1998, Cohen et al. 2007). This has been the most common view of the relationship between theory and social research, or in other terms, deductive theory or deductive reasoning, as opposed to generating a theory (Cresswell 2003). Alternatively, and as understood here, research observations might yield material for developing hypotheses that contribute to theory generation (Cresswell 2003, Bryman et al. 2008). A hypothesis is situated at a lower level to that of a theory, and has been defined as

\[ \text{a conjectural statement of the relation between two or more variables} \]

(Kerlinger 1986, p. 17)

(Kerlinger 1986) further explains that those hypotheses are declarative sentences whose stated relations are implicitly testable. As explained in Section 1.4, this research engages with current design practices in packaging sustainability, using the Australian food and beverage packaging industry (AF&BPI) as a case study. To ensure that the research procedures are directed towards the objectives of this investigation, an inductive approach to the theory-research relationship has been chosen. Inductive approaches have been referred to as an alternative to deductive ones (Creswell 2006). Herein, theory/hypothesis generation is situated as the outcome of the research, which is inductively drawn from research observations (Glaser and Strauss 1965, Miles and Huberman 1994, Neuman 2003) (Figure 4.1).

\(^3\) Using theory to test a hypothesis or hypotheses is based on the positivist belief which assumes that the researcher determines the data collection methods to produce findings that respond to research problems based on theory that has been previously established (CRESWELL, J. W. 2006. Qualitative Inquiry and Research Design: Choosing among Five Approaches, Thousands Oaks, CA, Sage Publications.).
This investigation is embarked upon to develop a series of hypotheses that account for the research situation, namely, what is design? and, how are design practices conducted within specific contexts? (Section 1.4).

4.2 Approach, assumptions and strategy

It is fundamental to recognise and validate the actualities of those involved in design practices as viewed from their own perspective within their social context. This recognition allows for an explanation of the ways in which those involved in such practices manage their roles and resolve their main concerns (Neuman 2003). This investigation takes an interpretative approach to the research, in that it explores relevant social actions among those being studied, to which these participants attach subjective meaning embedded in the meaning system that they share. Such actions influence and shape their social reality which is both created by them and constantly shifting. In contrast to the positivist paradigm\(^4\), the interpretative approach is concerned with

the systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds (Neuman 2003, p. 76).

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\(^4\) A paradigm is defined as “the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways” Guba and Lincoln p.163-164). The two main research paradigms are positivism and interpretivism. Essentially, positivism is concerned with understanding human behaviour, whereas interpretivism places emphasis on explaining it.
The interpretative approach allows the investigator to look at the social reality of those being studied, as defined by the subjects themselves, based on interactions with others in ongoing processes of communication and negotiation (Neuman 2003). The emphasis is on interpreting the beliefs, actions and interactions of those involved in design practices: the former only acquire meaning because the latter assign meaning to situations they share (Neuman 2003, Bryman 2008) (Table 4.1).

<table>
<thead>
<tr>
<th>reasons for research</th>
<th>to understand and describe meaningful social action</th>
</tr>
</thead>
<tbody>
<tr>
<td>nature of social reality</td>
<td>fluid definitions of a situation created by human interaction</td>
</tr>
<tr>
<td>nature of human beings</td>
<td>social beings who create meaning and who constantly make sense of their world</td>
</tr>
<tr>
<td>theory looks like</td>
<td>a description of how a group’s meaning system is generated and sustained</td>
</tr>
</tbody>
</table>

**Table 4.1 Interpretive approach to research**

Source: Neuman (2003), Bryman (2008)

In the interpretative approach, the epistemological assumptions of the research are related to the interpretation of the social world through an examination of the beliefs, or set of meanings, used by those being studied to make sense of their social reality. The ontological assumptions of the research refer to the active role that the meaningful, ongoing context-bound actions and interactions of those involved design practices have in constructing their constantly changing social reality (Neuman 2003, Punch 2005, Creswell 2006, Bryman 2008) (Figure 4.2).

**Figure 4.2 Epistemological and ontological assumptions**

According to the inductivist, interpretive and constructivist character of this investigation, the selection of a qualitative\(^5\) research strategy of data collection is suitable (Marshall and Rossman 1989, Creswell 2006, Bryman 2008, Denzin and Lincoln 2011). A qualitative strategy allows for the proposition of general research questions, which are refined as the study progresses, becoming more focused with ongoing analysis. The research seeks to give explanations to purposeful actions through a coding process, resulting in a series of hypotheses that explain the reality of those being studied and offer definitions that are comprehensible to them in their own terms (Denzin and Lincoln 2011) (Figure 4.3).

![Figure 4.3 Qualitative research strategy](source: Denzin and Lincoln (2011))

Qualitative research is an umbrella term under which a variety of research methods come together, all of which use data to foster an in-depth understanding of the ‘why’ and ‘how’ of human actions. It has been proposed that such methods could be organised under five different traditions: biography, phenomenology, grounded theory, ethnography, and case study (Creswell 2006, Denzin and Lincoln 2011). The diverse qualitative approaches ask researchers to answer different kinds of research questions and make use of different analytic tools.

\(^5\) Qualitative research strategies have often been considered “impressionistic, anecdotal, unsystematic and biased” by quantitative researchers (Charmaz 2006, p.5). Such criticism has its basis in the fact that it deals with unstructured data and is often reliant on the researcher as the main instrument of data collection; this is opposed to the natural scientific model, particularly positivism, which seeks rigorous and exact methods to measure ‘social reality’ (Bryman 2008).
4.3 Grounded Theory

In Grounded Theory, research questions may be directed toward generating a theory of a process, such as the exploration of what brings design practices into existence and how design practices are conducted in organisations within the AF&BPI context. This then allows the investigator to generate hypotheses, in this case to articulate the broader role of design practice in packaging sustainability (see Section 1.4). It has been suggested that a major gap in current research on design is the lack of a theory of design generated out of the reality of design practitioners:

One of the deep problems in design research is the failure to develop grounded theory out of practice. Instead, designers often confuse practice with research. Instead of developing theory from practice through articulation and inductive inquiry, some designers simply argue that practice is research and practice-based research is, in itself, a form of theory construction. Design theory is not identical with the tacit knowledge of design practice. While tacit knowledge is important to all fields of practice, confusing tacit knowledge with general design knowledge involves a category confusion (Friedman 2003, p. 519).

According to Friedman (2003), research on design practices must result in the development of a general theory that allows for a vastly different mode of conceptualisation from that found in the implicit knowledge embedded in the activity of design or in the outcomes of such activity. It is precisely on this that the relevance of this investigation lies. The main focus is on the review of design practices in their real contexts, as opposed to design activities, processes or the outcomes of such processes, since those are topics that have been studied at great length within the design literature. For design to become a discipline that can function as an agent of change, therefore, it needs to review its purpose and the motivations of those involved in its practice, while acknowledging the inherent complexities of their actions and interactions.

Grounded Theory (GT) is a suitable research method for this investigation, as it provides for two outcomes: the generation of theory from empirical data gathered and analysed systematically; and the identification of incidences of symbolic interactions between those involved in design practices within the area of study. Glaser defines GT as

the systematic generating of theory from data, that itself is systematically obtained from social research. Thus, the Grounded Theory method offers a
A rigorous, orderly guide to theory development that at each stage is closely integrated with a methodology of social research (Glaser 1978, p. 2).

He explains further that the GT process consists of linking data collection with analysis. It is a general methodology of analysis linked with data collection that uses a systematically applied set of methods to generate an inductive theory about a substantive area. The research product constitutes a theoretical formulation or integrated set of conceptual hypotheses about the substantive area under study (Glaser 1992, p. 16).

Substantive theory refers to the “formulation of concepts and their interrelation into a set of hypotheses” based on research in the area of study (Glaser and Strauss 1965, p.5). Data, hence, is collected in order to understand the research situation as it is; the aim is to “generate a theory that accounts for a pattern of behaviour which is relevant and problematic to those involved” (Glaser 1978, p. 93).

Theory, then, is found in research data; it emerges rather than being predefined and the research sets out to discover such a theory, accounting for the research situation by turning to empirical data for validation (Punch 2005, Cohen et al. 2007). The substantive theory that ‘emerges’ from the data explains the recurrent patterns of behaviour of those being studied. Glaser asserts that for GT to work it needs to explain the major variations in behaviour in the area with respect to the processing of the main concerns of the subjects. If it fits and works the grounded theory has achieved relevance. [...] it should be readily modifiable when new data presents variations in emergent properties and categories (Glaser 1992, p. 15).

As demonstrated in Figure 4.4 below, the emerging theory is what guides the process as a whole, and it is achieved through constant comparison (see Section 4.10), which is the element that distinguishes GT from ‘traditional’ methods of theory development.
In GT, theory generation and research are two parts of the same process involving a phase of moving back and forth between data and theory to establish the conditions in which the theory either ‘fits’ or does not (Bryman et al. 2008). The GT process, as portrayed in Figure 4.4, begins with a general research question; subsequently, relevant individuals are theoretically sampled (see Section 4.3.2). Relevant data are collected and then coded and preliminary concepts are generated – constant movement forward and backward between these steps is involved. Through constant comparison between concepts – which is the distinctive element of GT – categories then emerge, which are saturated during the coding process; relationships between categories are made from which hypotheses emerge. If needed, the process is repeated; further data are collected through theoretical sampling (Bryman et al. 2008).

There are essentially the three results the GT process: concepts, categories and hypotheses. Concepts are defined as the “underlying, meaning, uniformity and/or pattern within a set of descriptive incidents”. A category is a type of concept that is “usually used for a higher level of abstraction” (Glaser 1992, p. 38). Hypotheses are the initial conjectures that the researcher arrives at through the connections made between categories (Glaser 1992, Bryman 2008). In the following chapters, the Grounded Theory is thus derived from
data and then illustrated by characteristic examples of this data (see Section 4.10 for a detailed explanation of the analysis strategy) (Glaser and Strauss 1967).

### 4.3.1 The Grounded Theory debate: emergence vs. forcing

In 1965, sociologists Anselm Strauss and Barney Glaser participated in a collaborative study\(^6\) of patients dying in hospitals, focusing on two aspects of the process: the trajectory of dying and the communication of information about their condition to the patient. The substantive theory that emerged from this study was named Grounded Theory (GT) and was discussed in two books: *Awareness of Dying* in 1965 and *The Discovery of Grounded Theory* in 1967. According to its developers Glaser and Strauss, GT was developed in an attempt to bridge a gap between theory and empirical research that existed at the time. They asserted that the emphasis placed on rigorous standards for the verification of quantitative approaches undermined the need to discover “what concepts and hypotheses are relevant for the substantive area being researched” (Glaser and Strauss 1965, p.5)

The GT method was further explicated in Glaser’s *Theoretical Sensitivity* in 1978. However, in the years that followed, GT was the subject of much discussion and clarification, and Strauss’ and Glaser’s re-conceptualisation of its basic principles led to two diverging understandings of GT. These discussions resulted in an extended debate between its founders and eventually a split, made evident when Strauss published *Qualitative Analysis for Social Scientists* in 1987 and in 1990, *Basics of Qualitative Research: Grounded Theory Procedures and Techniques* together with Juliet Corbin.

As a way of responding to Strauss’ books, Glaser published *Forcing vs. Emerging: Basics of Grounded Theory Analysis* in 1992, in which he also published a letter sent to Strauss in September 1991. In his book, Glaser set out, chapter by chapter, the differences between Strauss’ claims and what he argued was ‘original’ GT. Explanations were given to show how Strauss, according to Glaser, was not referring to GT in its originally intended form. Glaser (2001) asserts that in his approach, theoretical concepts can be readily related to other concepts. In contrast, in Strauss’ approach there is an accurate or precise description of data as in other qualitative data analysis (QDA) methods. Descriptions, Glaser (2001) emphasises, do not possess such a conceptual nature and cannot be compared to each other; rather they are ‘forced to fit’ into concepts that disregard

\(^6\) The objective of the study was to understand the relationships between dying patients in hospitals and their relatives, based upon whether or not the patients acknowledged their own terminal condition.
theory emergence. Forcing data to fit into preconceived concepts intrinsically situates the data in time and place and, inherently, relates it to people; then “QDA loses its true abstraction; hence, generalisability” (Glaser 2001, p.5).

Essentially, Glaser (1992) described the disagreement in terms of ‘emergence’ and ‘forcing’, which fundamentally differentiates the methodology from others, (Table 4.2).

<table>
<thead>
<tr>
<th><strong>GT debate:</strong></th>
<th>emerging (Glaserian)</th>
<th>vs. forcing (Straussian)</th>
</tr>
</thead>
<tbody>
<tr>
<td>structure of coded data</td>
<td>theoretical content can be readily related to other incidents, constant comparison</td>
<td>detailed description of data, hard to compare to other incidents</td>
</tr>
<tr>
<td>conceptualisation</td>
<td>theoretical content can be readily related to other incidents, constant comparison</td>
<td>detailed description of data, hard to compare to other incidents</td>
</tr>
<tr>
<td>theoretical sampling</td>
<td>data collection is controlled by the emergent theory, abstract from people, place and time</td>
<td>sampling process guided by people / incident’s explicit characteristics situating relationship in place and time</td>
</tr>
</tbody>
</table>

Table 4.2 The GT debate: emergence vs. forcing  
Source: Glaser (2001)

Parker and Roffey (1997) suggest three essential dissimilarities between the approaches of Strauss and Corbin (1990) and Glaser (2001), articulated as

1) the degree of formal structuring in coding data;
2) the degree of formal structuring in generating a theoretical framework; and
3) generating the focal research issues.

The two approaches might reflect different basic philosophical paradigms and, therefore, represent distinct approaches to GT. Glaser asserts that to appropriately choose GT as a research approach, researchers need to be clear about their research questions and assumptions, and the effect that this approach will have on the research process and outcomes (Glaser 1992).

Glaser states that GT research goes “beyond conjecture and preconception to the underlying processes of ‘what’s going on’ in substantive areas” (Glaser 1994b, p.4). The Glaserian GT method is uniquely suited to this investigation in assisting both the understanding and the facilitation of change. That is, identifying the actualities of those involved in the planning and design of packaging and design practices, in the Australian
food and beverage packaging industry in order to make recommendations for actualising the role of design practice in packaging sustainability.

4.3.2 Glaserian GT: abstraction of time, place and people

Glaserian GT is abstracted from time, place and people, and conceptually generates a hypothesis. Glaser distinguishes the abstraction element by explaining that “GT exists on a conceptual level and is composed of integrated hypotheses”, whereas QDA produces “description with or without conceptual description mixed in” (2001, pp.1-2). (Glaser 2001) asserts that concepts generated are timeless in their applicability, which is the most important aspect of conceptualisation: “concepts last forever” (Glaser 2001, p. 15). The conceptualisation property of GT is essential to generating a theory since the data, or incidents studied, are diverse. This means that concepts are, if appropriately generated, applicable in other situations in different periods of time. Concepts generated from the data collected in this investigation will provide a theoretical framework for explaining the role of design practice in packaging sustainability, and they can be used to develop a formal theory of design in the broader context of sustainability. In GT, the number of relevant people or incidents is determined by ‘theoretical sampling’, in which the focus is placed on the data gathered rather than on the interviewees. Glaser states that theoretical sampling is

the process of data collection for generating a theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find it, in order to develop his theory as it emerges. This process of data collection is controlled by the emergent theory, whether substantive or formal (Glaser 1978, p.38).

This means that the general procedure of theoretical sampling is to identify codes in the raw data through a constant comparative analysis as soon as data is collected. The distinctive characteristic of theoretical sampling is that it is an ongoing process rather than a single phase. This is as opposed to characterising people in order to create concepts. Glaser states that

Conceptualisation is the medium of Grounded Theory for a simple reason: without the abstraction of time, place and people there can be no multivariate, integrated theory based on hypothetical relationships (Glaser 2001, p. 13).
The fundamental assumptions are summarised in the following three points:

1. The underlying main concern and core category will emerge with consistent use of the method;
2. The social organisation of a group exists and is available to be discovered; and
3. The concerns of the interviewees rather than those of the researcher are the focus of the research (Glaser and Stern 1998, pp.44-45).

Thus, the generalisation in GT is not made through the accurate description of a studied unit transposed onto a larger unit; GT generalises to a transcending process or other form of core variable (Glaser 2001). Place is not relevant to GT, as it is not necessary to describe a whole unit; the important thing is to identify the core process within that unit (Glaser 2001).

In GT, behaviour is a pattern that a person engages in, it is not the person. Concepts are generated through the study of people’s behaviours, as opposed to being related to their characteristics. Only in this way can these concepts be applied later to ‘any’ time and place. The emphasis is put on transcending description; by generating concepts from data abstraction, the developed theoretical frameworks, hypotheses and propositions explain the collected data. Ultimately, a concept should be easy to use outside of the substantive area where it was generated.

4.4 Methodological rigour and validity

Validity in research has been considered the ‘evidence’ that a given research instrument actually measures what it claims to measure; that is, the correlation between a construct and the data (Neuman 2003, Cohen et al. 2007). Validity is found in the fairness, honesty, balance and depth of the data gathered (Punch 2005). Glaser (1992) suggested that good GT should satisfy six key criteria: fit, work, relevance, modifiability, parsimony and scope of explanatory power. Parker and Roffey (1997) provide their interpretation of these criteria as follows:

- **Fit** – does the theory fit the substantive area in which it will be used?
- **Understandability** – will non-professionals that are concerned with the substantive area understand the theory?
- **Generalisability** – does the theory apply to a wide range of situations in the substantive area?
• Control – does the theory permit the user some control over the structure and process of daily situations as they change through time? (Parker and Roffey 1997, pp. 233-234).

In terms of validity, criticism has been raised of GT’s status as a theory, as it investigates the actualities of the real world and analyses the data with no preconceived hypothesis (Thomas and James 2006). The fundamental intention for using the GT approach in this investigation is to interpret a textual database and discover or label variables and their interrelations; Glaser and Strauss (1967) argue that facts can be validated by replication, which is achieved by comparative analysis:

> one generates conceptual categories or their properties from evidence; then the evidence from which the category emerged is used to illustrate the concept (Glaser and Strauss 1967, p. 23)

GT does have its own source of rigour: it is responsive to the situation in which the research is undertaken (Glaser and Strauss 1967). Measurement takes place in the data collection process; in qualitative research, contrary to the quantitative-positivist approach, the concern is with the ‘authenticity’ of the data rather than with its ‘validity’ (Neuman 2003).

Punch (2005) suggests that qualitative researchers require moving away from the positivist notion of validity based on ‘demonstrating’ theories. In contrast to the quantitative-positivist conception, interviews in qualitative research look for qualitative knowledge that is not ‘quantifiable’ (Kvale and Brinkmann 2009). Thus, quality in the reporting and rigour in the interpretation of their meaning is crucial (Neuman 2003). Inevitably, data collected from interviews has a degree of bias because of the subjectivity of interviewees’ opinions and perspectives. The validity of interview data is thus regarded here in terms of ‘degree’ as opposed to being an ‘absolute’ (Goulding 2002). Limitations of interviews, such as nuances of meaning, are disregarded to prevent ‘bias and distortion’, a method which emphasises the character of this interaction as knowledge production (Kvale 1996). It has been suggested that reliability is a required but insufficient condition for validity in research; validity, on the other hand, may be a sufficient but unnecessary condition for reliability (Cohen et al. 2007).

### 4.5 Data collection strategy

In Section 1.5, it was established that according to the GT method, an initial review of the literature on the research area should be undertaken in order to provide a general
theoretical background to assist the planning phase of the research. Then, when the data collection and analysis process commences, the review of literature on emergent themes from interview data becomes relevant. (Glaser 1978) emphasises that trying to force the findings into a preconceived theoretical framework should be avoided in reviewing the literature. Further, an exhaustive revision of the literature is deliberately avoided yet without ignoring extant and relevant knowledge (Glaser and Stern 1998). This is to ensure that the analysis of the data actually refers to what is grounded in the data as opposed to analyse it through existing theoretical frameworks to keep the researcher free of influences. Any theoretical framework must earn its relevance by emergence alone in a grounded theory study (Glaser 2001).

In Section 1.4, it was explained that one of the principal aims of this research is to review how design practices within the Australian food and beverage industry are conducted, acknowledging issues that concern those involved as they themselves perceive such issues. In terms of strategies for the collection and analysis of qualitative empirical data, Miles and Huberman (1994) distinguish six: ethnography; field study; interviewee and non-interviewee observation; interviews; and archival records. To these, Bryman (2008) adds three: focus groups; discourse and conversation analysis; and collection and qualitative analysis of texts and documents. Creswell (2006) proposes two more: phenomenology and Grounded Theory. Yet Glaser (2001) asserts that GT is a general method for the generation of theory that can be used either in quantitative or qualitative research. According to Yin (2002), all of these strategies can be used for three different purposes – explanation, exploration and description.

4.5.1 Data collection through interviews

This section describes the initial planning of the research procedure, beginning at the point when the research purpose was established, including the selection and preparation of interviews as the primary research method for data collection. In Section 4.7, the final interview cohort is described, including how the recruitment of interviewees was altered as a result of the theoretical sampling process. In the Glaserian GT approach “all is data”: “anything that crosses the researcher’s way” can be used to enlighten the analysis process (Glaser 1992, p. 145). An appropriate use of interviews as a data collection method should aim to access

what is ‘inside a person’s head’, [...] to measure what a person knows (knowledge and information); what a person likes or dislikes (values and
preferences), or what a person thinks (attributes and beliefs) (Tuckman 1972, p.34).

Here, interviews allow the collection of non-numerical and unstructured data regarding the perceptions, opinions and assumptions of those involved in design practices. Then, the relevance of conducting interviews as a research method relies on the fact that they are non-ordinary conversations, as they are constructed and have a specific purpose (Dyer 1995). In this case they are an exchange of views of assumed mutual interest between interviewer and interviewee on the research topic: issues arising from design practices and transformations required for progression toward packaging sustainability. The character of this interaction becomes the production of knowledge, which is actively and socially created by the interviewer and interviewee in a conversational structure through the use of questions and answers about the area of study (Kvale 1996, Kvale and Brinkmann 2009). It is thus crucial for the interviewer to ensure that the knowledge produced during interviews is research-relevant (Cannell and Kahn 1968).

In terms of the structure, semi-structured, open-ended interviews were chosen, since they are a direct and accessible means to observe and elicit interpretations about design practices in the organisational context of the AF&BPI. Semi-structured interviews allow for flexibility in format, yet they are conducted in a systematic, controlled way by the interviewer and it is necessary that the content be related to specific research questions and purposes (Sarantakos 1998, Cohen et al. 2007). In terms of format, open-ended questions were selected, since they provide, according to Kerlinger (1970), a point of reference for interviewees' answers, rather than forcing them. Kvale and Brinkmann (2009) state that open-ended interviews seek to

obtain descriptions of the interviewees’ lived world with respect to interpretation of the meaning of the described phenomena (Kvale and Brinkmann 2009, p. 27).

Open-ended questions also provide the interviewer with an opportunity to assess the respondent’s knowledge; they allow the interviewer to make a more accurate appraisal of the interviewee’s beliefs; and they can also result in unexpected or unanticipated answers which enrich the relationships between variables made earlier (Kerlinger 1970). In terms of interview form, individual, face-to-face is the preferred interview method, one that is widely used in qualitative research since it provides the possibility of dispelling ambiguity in respondents' answers (Cohen et al. 2007).
4.5.2 Interview schedule

The content of the interview is created by translating the research objectives into questions which will become the basis of the interview schedule (see appendix A) (Cohen et al. 2007). The format of the schedule, however, is considered a guide, with topics that include suggested questions (Dyer 1995). This means that if a new topic emerges from the interview, then the researcher has the flexibility to ask a question about such a topic. Flexibility is also allowed in the sequence and wording of questions, as well as follow-up questions, since they create a conversation-like atmosphere and interviewees are able to talk more freely about their insights and opinions (Kvale and Brinkmann 2009). That is, there is still the opportunity for spontaneity, and the interviewer is able to push for complete answers and also for deeper responses about complex issues; thus, the answers have a low level of ‘uniformity’.

To delineate the interview questions it is necessary to name the variables or areas of the research problem that the investigation aims to ‘assess’ (Tuckman 1972). In this investigation, interviews are divided into 3 main themes which consist of eleven questions in total. The three main themes are: packaging design issues, packaging industry issues and packaging sustainability issues, and are explained below (Figure 4.5).

Figure 4.5 Main themes of the interviews
In the **packaging design issues** section, questions relate to the perceptions that interviewees have of their own roles and responsibilities (open to interpretation), and the way they describe their involvement in a design situation, design processes and design-related activities. This reflects what type of decisions they make as well as the type of interaction they have with others involved in design practices.

The **packaging industry issues** section includes questions related to interviewees’ perspectives on the current role of packaging: a discussion on issues related to the physical configuration of packaging, including the perceived drivers for packaging innovation and influences for near-future trends, as well as their understandings on what ‘successful’ packaging is.

The **packaging sustainability issues** section comprises questions addressing interviewees’ perspectives on their understandings of packaging sustainability and issues of their decision-making process, including their ranking of the importance of environmental considerations from their role’s perspective. Also in this section, are issues of the type of tools or information that interviewees use or, in their opinion, may be useful in making more ‘informed’ decisions: issues related to their opinions about ways to encourage organisations to engage in issues of packaging sustainability, as well as the challenges faced by the AF&BPI from the interviewees’ points of view.

Once the topics are defined, another important consideration is the interview structure and the question-response mode. For this investigation, a semi-structured interview format was selected (Cannell and Kahn 1968, Fontana and Frey 2000). The interview schedule consists of the three general themes that in turn have a list of potential questions.

As was previously explained, the content of the interview guide is based on and directly linked to the research questions as portrayed in **Figure 4.6** (p. 108).
Chapters [5], [6], [7] and [8] explain in more detail how the research questions guide the study in discovering the main concerns of interviewees by discussing topics that allow for an understanding of their beliefs, actions and interactions. They present the raw interview data along with explanations on how themes and concepts were developed.

4.6 Ethical considerations

Ethical considerations in this investigation are related to issues resulting from the participation of interviewees and the data gathered, since they reflect opinions and behaviours. Such issues are also most likely to emerge as being significant in qualitative research, whose methods for data collection are more ‘intrusive’ than quantitative ones (Punch 2005). Furthermore, Cohen et al. (2007) assert that ethical issues can arise in any stage of the research process,

from the research topic selection; the context of research; the procedures to be adopted; methods of data collection; the nature of participants; the type of data collected; and what is to be done with the data (Cohen et al. 2007, p. 37).
Ethical issues are anticipated in the Ethics Approval Application, wherein a detailed plan to avoid or minimise such issues is provided (Creswell 2006) [refer to appendix B Ethics Approval Application]. Issues such as the cost/benefit ratio that may arise need to be appropriately balanced; therefore, it was necessary to ensure that the research interest in producing scientific knowledge did not undermine the rights of those being studied (Neuman 2003). While such a balance may be subjective, the expectation is that the rights and values of research interviewees were not potentially threatened by the research (Cohen et al. 2007). Ethical guidelines were pre-empted through informed consent, confidentiality issues and consequences for participants, all of which are described in the next three subsections.

### 4.6.1 Informed consent

Interviewees are to be informed about the research objectives and purposes as well as potential risks and benefits from participation in the research project (Cohen et al. 2007). Those who agree to participate in the interviews are provided with an Informed Consent Form (see appendix C) and a Plain Language Statement (see appendix D), which consists of a document describing the purposes, procedures and demands of the study. It also includes a clear statement about the voluntary and free character of participation as well as the opportunity to withdraw from the project at any time. Interviewees are also advised that the privacy of the information they provide will be safeguarded, as well as of the possible uses of data, that is publication in journal papers or conference presentations. In this document, permission to audio-record the interview is requested, with an explanation that this process facilitates transcription by the researcher, and specifications of how their confidentiality and anonymity is protected. After they have read and agreed to these conditions, they are required to sign a document that states so.

### 4.6.2 Confidentiality issues

In this research, confidentially refers to non-disclosure of any private data given by interviewees which could reveal their identity, such as their name, their company’s name or any other information that may potentially be recognised by others (Kvale 1996). The measures taken here to ensure the confidentiality of interviewees are described as follows:
a. The interviewee’s name and organisation is removed from the transcriptions and replaced with an arbitrary alphanumerical code that only the researcher is able to identify.

b. The transcribed text is as loyal to the interviewee’s oral statements as possible, however, comments related to an organisation’s products, clients or country are removed from transcriptions to ensure that any interviewee cannot be identified.

c. The digital audio files and hard copies of transcriptions of the interviews are kept in a locked filing cabinet that only the researcher has access to.

d. The digital version (word documents) of the transcriptions is stored on a computer drive that only the researcher has access to. As a security measure, a back-up of the digital transcriptions is made and is stored in a different locked filing cabinet from that storing the originals.

e. Hard copies of transcriptions as well as the digital audio files of the interviews need to be kept for a period of 5 years after completion of the study in secured storage and then will be destroyed as prescribed by university ethical procedures. The digital files will also be removed from the computer drive.

4.6.3 Consequences for interviewees

Personal consequences in respect to the benefits and risks of interview interaction with interviewees are taken into account in this investigation through the Plain Language Statement (Kvale 1996) (appendix C). Potential interviewees for this research are informed about the likelihood that they will not directly benefit from participation. However, they are informed that the research outcomes may benefit design and packaging areas in general, and potentially further advance knowledge in design for sustainability.

4.7 Interview cohort

This section explains the particularities of the interview process to portray how the theoretical sampling process was undertaken, as well as the necessary adjustments made throughout the process.

The initial criteria for selecting potential interviewees were based on two distinguishing facts: on the one hand, their involvement, either directly or indirectly, in design decisions influencing packaging decisions, and, on the other hand, their existing interest in/awareness on packaging sustainability issues. The later was implied by interviewees’ attendance at roundtables organised by the Sustainable Packaging Alliance (SPA), and
conferences and technical dinners on packaging related topics organised by the Australian Institute of Packaging (AIP). To minimise ethical issues in the interviewees' selection process, the researcher of this thesis was present at the aforementioned events and as a delegate of the events received a copy of the attendance lists, as given to all delegates. The researcher approached prospective interviewees at such events to gauge their interest in participating in the study. Upon their agreement, they were contacted via email or/and phone to follow up on their participation in the interviews.

The preliminary sampling included those within organisations of the AF&BPI with insights on packaging design, packaging technology, environment and marketing. However, as Section 4.10.1 will further discuss, through the constant comparison of the data collected, the sampling was directed to other relevant interviewees until theoretical saturation was achieved. Further sampling included interviewees with insights on environmental design, those in policy-making, procurement, retailers and those with design theory and ‘sustainable’ design expertise. Through constant comparison of the data (Section 4.10.1) it emerged in the data that packaging trends in the European and North American contexts influence the Australian one. Therefore, international prospective interviewees were also contacted.

### 4.7.1 Sending of invitations

A written invitation (see appendix E) from the researcher was sent via email to prospective interviewees, including a brief explanation of the project as well as the reason for approaching them. Emails also contained a summary of the research objectives and anticipated outcomes as well as how participation in the interviews could contribute to the achievement of those objectives. A general description of the interview procedure, the content of the interview schedule and estimated time required was given. The invitation also informed the potential interviewee of a follow-up telephone call for further discussion of their potential participation, including ethical considerations which were explained in Section 4.6.

### 4.7.2 Interview selection

The sampling size was determined by theoretical saturation as opposed to finding a representative sample of the area of study. The use of the grounded theory approach requires a novice researcher to commit to a time-consuming and long analysis process (Glaser 1992). While it has been established that, based on the Glaserian GT method, in the conceptualisation process it is important to avoid characterising the interview sample,
for the purposes of complying with university research protocols, the time and place in which the interviews were conducted as well as the roles of the individuals that participated in interviews are recorded here. Once again, this is disregarded in the conceptualisation of the interview data.

Interviewees from twenty different organisations made up the initial interview sample: six brand owners; six design consultancies; three brand consultancies; two packaging manufacturers; one packaging consultancy; one retailer and one government agency (Figure 4.7).

![Organisational representation in interviews and their relevance to the packaging supply chain. Adapted from: Stewart (2007)](image)

According to the type of organisation represented and their position along the packaging supply chain, interviewees are divided as follows (Figure 4.8): 14 interviewees were from brand owners; 9 from packaging manufacturers; 6 from design consultancies; 3 from brand consultancies; 2 from retailers; 1 from a packaging consultancy; and 1 from a government agency. In a number of instances, more than one interviewee came from the same organisation. Organisations from overseas included design consultancies and educational institutions that provided a design consultancy service. Five interviewees from the USA and Europe participated in the interviews.
In terms of location, interviewees were given the choice of interview location: for twenty-five interviewees the number one preference was at their offices; however, three interviewees preferred to come to the researcher’s office; eight interviewees, for geographical reasons or because of time constraints, opted for being interviewed via telephone.

4.8 Interview procedure

Prior to each interview, a brief reminder of the structure and general content of the interview was given, as well as its possible duration (Kvale 1996). The right to refuse to answer any question or to stop the interview at any time without any further clarification was also reiterated. Interviewees were reminded of the research purposes and the interview content. Then, interviewees were asked to read the Plain Language Statement (appendix C) and sign it before the interview began, specifying their agreement or not to the interview being audio-recorded to assist the analysis of the data. In the case of interviews performed via telephone, a copy of the Plain Language Statement (appendix C) was mailed to the interviewees prior to the interview with a self-addressed envelope to return it to the researcher once it had been signed. The researcher called the interviewee on the previously agreed telephone number and at the previously arranged time. The same reminders as in face-to-face interviews were given to interviewees, including the use of a digital recorder to audio-record the conversation.

A digital recorder was used to audio-record the interviews. Notes were taken in addition to the audio recording, in order to highlight points that were considered relevant for the analysis of the interviews. The notes were also used as a reminder for the researcher to clarify information or request a more in-depth response from interviewees (Cohen et al. 2007). The interview structure and length varied in cases where the interviewee raised useful topics, as dictated by the research objectives (Cresswell 2003). The interview duration varied from between twenty-five minutes and ninety minutes depending upon...
the level of interviewees’ engagement in the discussion. Interviewees were given the opportunity to interrupt the interview if any question required further explanation or clarification, which many of them did. There were two instances in which the interview was undertaken with two interviewees at the same time, as requested by them. This changed the dynamics of the conversation; yet in terms of the analysis process this assisted the constant comparison process at the time of the interview, and the data collected became theoretically relevant at once.

At the end of each interview, interviewees were appropriately acknowledged and thanked for their time and assistance. They were also advised of a possible timeline and plan for the completion of the research project. A follow-up email was sent to each interviewee to inform them of the status of the research.

4.9 Interview transcription

According to Cohen et al. (2007), transcribing interviews is a critical phase in interviewing due to the possibility of massive data loss, distortion and the reduction of complexity. Issues in the transcription of interviews relate to the decontextualisation of the data from the dynamics of the situation, from the live form, and from the social dimension of their source (Cohen et al. 2007). Kvale (1996) adds that transcriptions must be considered interpretations of the original rather than copies; therefore, great consideration needs to be applied to the level of detail that is included in the transcription, taking into account the research purpose and the intended use of the transcription. In the Glaserian approach, recording the interview is regarded as obtrusive since the discussion of sensitive issues might be avoided by interviewees. Due to the inexperience of the researcher in using the GT method, recording the interview was necessary to comply with university requirements and protocols of producing ‘evidence’ for concepts generated. As previously mentioned interviewees’ names and organisations have been removed from the transcriptions and replaced with arbitrary alphanumerical codes that only the researcher is able to identify. The tone of voice, intonation and breathing or hesitations of interviewees are not taken into account, as the focus of the investigation is on the verbal rather than non-verbal content. The analysis process is discussed in Section 4.10.

4.10 Analysis strategy

The analysis process in GT reaches its final stage once sufficient data has been gathered to create a theoretical explanation of what is happening in the area of study and what
constitutes its key features. Allowing the theory to emerge is the objective, as opposed to achieving sample representation (Glaser and Strauss 1967). In Section 4.3, the GT data collection and analysis process was outlined; here, the actual analysis process undertaken by this investigation is described.

4.10.1 Constant comparison

The iterative character of constant comparison allows for the maintenance of a close connection between data and conceptualisation and, therefore, of the correspondence between concepts and categories, which determines when the data gathered is sufficient (Glaser 1978, Bryman 2008). That is, every time data is gathered it has to be compared with previous sets of data; when there are no new incidents, then the data gathering process ceases. The analysis of interview data, in GT, involves searching behind the actualities by looking for codes, then concepts and finally categories (Glaser and Strauss 1967); in other words, data reduction, data display and conclusion-drawing (Miles and Huberman 1994).

Data reduction involves a process of the selection, focus, simplification, abstraction and transformation of data to enable the researcher to identify categories, themes and patterns (Marshall and Rossman 1989, Miles and Huberman 1994). Once the data is reduced to these categories, themes and patterns, it is independently displayed in diagrams. According to Marshall and Rossman (1989), organising and compressing data in diagrams facilitates the emergent hypotheses to be tested against the data and alternative explanations of the data to be found. Following the data display, the operations of data analysis consist of coding, categorisation and developing propositions as illustrated in Table 4.3.
Table 4.3 The GT data analysis process


From Table 4.3, it can be seen that the analysis process starts with data reduction and consists of several steps that include constant comparison of data/incidents, identification of similar content (themes), grouping similar concepts (patterns) to finally elaborate the emerging hypotheses (propositions). The development of concepts is depicted in a series of figures exemplifying the coding process as depicted in Table 4.3.

4.10.2 Phases of the analysis process

As previously explained, conceptualisation is a key process of GT. It goes beyond any descriptive methods, disregarding time, place and people. In the case of this research, the process consists of an inductive phase of building theory from the data gathered through categorisation of the broad themes, to establish a generalised model of the role of design in contributing to sustainability.

Concepts are important elements of analysis since the theory is developed from the conceptualisation of data, rather than from the actual data. This process facilitates the comparison of a situation being coded under a certain category. The phases of the Grounded Theory analysis are described below in Table 4.4.
Coding consists of adding "labels to segments of data that depict what each segment is about" (Charmaz 2006, p. 3). The coding process in this research breaks down data into paragraphs and then rearranges it into concepts. The types of coding used here are open, axial and selective (Glaser and Strauss 1967). Open coding explores the data and identifies units of analysis to code for meanings, actions and events. Codes and subcategories are developed. Axial coding seeks links between categories and codes. Selective coding involves identifying a core code, and the relationships between that core code and other codes are explained.

A category is a theme or variable which makes sense of what an interviewee has said. It is interpreted in light of the area of study and other interviews, as well as the emerging theory. One category (occasionally more) will be found to have emerged with a high frequency and to be connected to many of the other emerging categories. This is what constitutes a core category. It is risky to identify a core category too early in the data collection process, however when it is clear that one category is mentioned with high frequency and is well-connected to other categories, it is safe to adopt this as the core category (Glaser 1978).

In collecting and interpreting data about a particular category, a point of saturation is reached: eventually the interviews add nothing to that which is already known about a category, its properties and its relationship to the core category. When this occurs, the coding for that category ceases (Charmaz 2006).

Glaser and Strauss (1967) insist that nothing should be forced on the data by looking for evidence to support established ideas; coding should be performed with an open mind. Glaser (2001) also recommends that if a researcher is uncertain about the process, they should simply analyse the data in front of them and record what is seen; this, in GT is called 'theoretical sensitivity'.
Furthermore, the ability to perceive variables and relationships is termed ‘theoretical sensitivity’ and is influenced by a number of things, including one’s reading of the literature and one’s use of techniques designed to enhance sensitivity (Punch 2005, Charmaz 2006). All this is done in conceptual rather than concrete terms. It is theoretical sensitivity that allows one to develop a theory that is grounded, conceptually dense, and well integrated (Charmaz 2006). Theoretical sensitivity will aid the discovery of the relationships between variables, enabling comparisons and conclusions to be drawn about the significance of certain factors in the relationship (Glaser 2001).

The method for organising the analysis is by research question (relevant for interview data collection), which implies drawing together all the relevant data for the precise issue of the research concerned, which drives the researcher back towards the main research enquiries (see Figure 4.6).

Interview questions 1, 5 and 6 are analysed in relation to research question [A]; its discussion is presented in Chapter [5]. Interview questions 2 and 3 are analysed in relation to research question [B1] and its discussion is presented in Chapter [6]. Interview questions 4 and 8 are analysed in relation to research question [B2] and their discussion is presented in Chapter [7]. Interview questions 7, 9, 10, and 11 are related to research questions [C] and [D] and their analysis is presented in Chapter [8]. Research question [E] is answered by the relationship of all four previous research questions, and is presented in Chapter [9].
It is recommended to read Chapter 4 Research Method before attempting to read this part of the thesis. Understanding the concepts of Grounded Theory will help in learning how the data is collected, presented, analysed and conceptualised.

part b corresponds to the central component of this investigation and is set out to present interview data and its analysis related to research questions [ A ], [ B1 ], [ B2 ], [ C ], and [ D ]. The pertaining interview data, concepts generated and their analysis are structured around the following four chapters:

Chapter 5 Packaging design practice presents and discusses issues regarding the setting and practice of design according to interviewees perceptions, which are related to research question [ A ].

Chapter 6 The idea of packaging and its validation discusses issues relevant to research question [ B1 ], namely interviewees’ beliefs on the role of packaging and its configuration.

Chapter 7 Packaging: sustaining the unsustainable? concentrates on a discussion on interviewees’ perceptions on two frequently divergent issues: packaging success and packaging sustainability. The interview data and analysis presented here are related to research question [ B2 ].

Chapter 8 Sustainability: option or necessity? distinguishes interviewees’ perceptions on four topics. The first two topics, namely drivers for organisations’ engagement on issues of sustainability and challenges faced by the AF&BPI in sustainability, are related to research questions [ C ]. The other two topics on environmental decisions rank and type of information/tools used or needed by interviewees’ are related to research question [ D ].

At the end of part b, a summary of the discussions of these four chapters is presented in order to bring together the answers obtained from four research questions setting the preamble for part c where research question [ E ] is discussed.
Chapter [ 5 ]

Packaging design practice

As discussed in Section 1.4, undertaking a review of the actualities of design practices in their 'real' contexts is important to understanding and explaining what those practices are and how they are constructed. This chapter presents and discusses issues related to research question [ A ] (see Section 4.5.2, Figure 4.6):

What is the current setting and character of design, and how are design practices conducted within the organisational context of the AF&BPI?

To understand the elements and intricacies of such practices, three sets of data from the interview schedule (interview questions 1, 2 and 3 respectively; appendix A) are reviewed here: interviewees’ roles and responsibilities, their involvement in design decisions, and their interactions with others in packaging design practices. The discussion of these issues is essential since it engages matters of definition of their own reality: how interviewees perceive their own roles; what their main concerns are; and how these shape design practices. Answering these questions, accordingly, allows for an explanation of what brings into existence design practices at a conceptual level.

To assist the reader, this chapter is divided into three main sections:

Section 5.1 concurrently presents the three sets of data related to interviewees’ perceptions on roles and responsibilities, involvement in design decisions and interactions with others in design practices. It includes a series of figures illustrating selected edited extracts from these sets of interview data.

Section 5.2 presents three recurrent themes identified in the three sets of data. Subsequently, it introduces three core concepts generated through the analysis of interviewees’ accounts.

In Section 5.3 presents the analysis of each concept separately in three subsections, each of which includes a diagram illustrating the coding process used to distinguish interviewees’ main concerns. This in turn leads to the generation of a final proposition named Frames of reference in three variants, and again includes figures depicting design practices at a conceptual level.

Section 5.4 provides a summary of the three propositions, which will be used to answer research question [ A ] in Chapter [ 9 ].
5.1 The role of design practice

The twofold question related to defining the roles and responsibilities of interviewees (interview question 1, appendix A) was formulated to be deliberately ambiguous so as to allow interviewees to unveil their own interpretations of such roles. In discussing interviewees’ roles it became necessary also to discuss their involvement in packaging design practice (interview question 2, appendix A) and their interactions with others involved in such practices (interview question 3, appendix A). Variation in interviewees’ responses was anticipated due to three main aspects: a) their different organisations; b) their different levels of involvement in packaging design; and c) the types of interactions with others involved in packaging design. The significance of their interpretations, however, relies on the fact that, according to the Grounded Theory method implemented in this research, they are consistent with interviewees’ main concerns and ways of resolving them (see Section 4.3.2). These three sets of data refer to issues related to research question [ A ], as portrayed in Figure 5.1.

![Figure 5.1 Relationship between interview questions 1, 2 and 3, and research question [ A ]](image)

A tendency prevailed to automatically characterise roles in relation to and by the explicit distinction of the positions and ranking held by interviewees. While this phenomenon was somewhat expected; inadvertent to interviewees was that their responses were implicitly influenced by the objectives and interests of the organisations to which they belong, and which they do not influence. The relevance of such answers relies on recognising interviewees’ level of awareness of the true nature of their roles.

A summary of the diversity of interviewees’ perceptions on their roles and responsibilities (related to interview question 1) are presented in Figure 5.2; interviewees’ perceptions on their involvement in packaging design decisions and their interactions with others involved
in design practices (related to interview questions 2 and 3) are presented in Figure 5.3. This selection is exhaustive of those themes discussed by the interviewees.

<table>
<thead>
<tr>
<th>Interviewees' Roles</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsible for reproduction issues, product development, engineering and maintenance</strong></td>
<td>Managing major projects</td>
</tr>
<tr>
<td>Being on the front side of the industry, more as a sustainable design consultant</td>
<td>Managing packaging innovations solutions</td>
</tr>
<tr>
<td>Predominantly involves the commercial aspects of packaging</td>
<td>Packaging development</td>
</tr>
<tr>
<td>Managing new own projects</td>
<td>National sales and marketing manager</td>
</tr>
<tr>
<td>A national role dealing with all the environmental management methods for the company</td>
<td>Dealing the major projects</td>
</tr>
<tr>
<td>interviewees' roles</td>
<td>Packaging technologist in the research and development area, looking at a new idea to identifying technical risks you need to test for</td>
</tr>
<tr>
<td>Looking after the brand</td>
<td>Consultant, advising companies in new uses for materials</td>
</tr>
<tr>
<td>Responsible for inputting for policies related to the recovery of packaging materials</td>
<td>Managing the research and design team; we do product design and innovation</td>
</tr>
<tr>
<td>Leading the packaging group</td>
<td>Provide support to the environment manager</td>
</tr>
<tr>
<td>Look after the national packaging covenant report</td>
<td>To position products</td>
</tr>
<tr>
<td>Managing director, responsible for the operations with and inside the country</td>
<td>Sustainable design research and consultancy</td>
</tr>
<tr>
<td>Look after the national packaging covenant report and making sure that all commitments are met</td>
<td>My title is national sales and marketing manager and my role in this business is to fit together three parts: top customer, emerging trends and branding</td>
</tr>
<tr>
<td>Looking after all cartons and bottles for the company</td>
<td>New product development and packaging design and development</td>
</tr>
<tr>
<td>Managing compliance and environmental improvement in operations</td>
<td>Sustainable design consultant, working at the beginning of the product development process</td>
</tr>
<tr>
<td>Designer part of the product development team</td>
<td>Development or re-development of products or brands</td>
</tr>
<tr>
<td>Development or re-development of products or brands</td>
<td>Positioning the brand</td>
</tr>
<tr>
<td>Waste project manager, looking after waste and recycling issues</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5.2** Summary of condensed responses to interview question 1 on 'perceptions on the interviewees' role'
Figure 5.3 Summary of condensed responses to interview questions 4 and 5 on ‘perceptions on involvement in design decisions’ and ‘perceptions on interactions with others involved in design practices’
Interviewees’ interpretations draw up boundaries in their roles which dictate the way they discharge their responsibilities; this implies that such awareness or unawareness has an impact on the way they handle their responsibilities. For instance, there were interviewees who characterised their role by portraying the high degree of influence or meaning that they believe their roles had, and was explicitly related to their job title. It was then important for interviewees to both: a) specify the departments, functions or team which they influence or are influenced by; and b) distinguish the level at which their role is carried out across the organisation, that is, at the local, national or global level. In other instances, there was a preference for describing their roles in terms of the influence that, according to their own perspective, they should have in a more practical sense. Here, some interviewees lamented that at times crucial decisions are taken away from them by others making such decisions, due to a lack of acknowledgement of their ‘real’ capabilities. Further, it was evident that some interviewees believed that their roles should be more influential since, according to them, they are better equipped to make some decisions associated with packaging design. It is precisely this level of awareness which is relevant to this research since it led some interviewees to suggest changes to an aspect or aspects of the current practices at the personal or organisational level, in order for them to have a more influential role.

In some instances the roles and responsibilities of interviewees were defined in terms of being specific and specialised. For example, some roles were characterised as involved in decisions related to technical aspects of packaging, yet subordinated to marketing or financial objectives. As for the responsibilities that these roles carry, these were frequently described in terms of improving or fixing existing issues of packaging to achieve very specific aims defined by others. Some roles were defined as explicitly looking at cost-downs or cost-effectiveness and predominantly broadening the range of products offered. Issues discussed in these instances included interviewees aiming to come up with ideas for new packaging products in order to increase packaging sales; looking at packaging improvements or renovations from the perspective of the structural performance of packaging or the technical specifications of materials; looking at the packaging applications of new materials and ways to innovate in terms of packaging formats; and, less frequently, design processes and manufacturing issues. An important aspect of these roles that emerged in the data is that they tend to try solutions on their own and once they have one that is acceptable, they present their results to others. While the responsibilities that they have are focused towards common goals, those who fulfil these roles frequently work individually as opposed to in teams.
Other roles were characterised in specialised terms, yet, their responsibilities were defined as creating new packaging as opposed to fixing or improving existing formats. While in these instances, interviewees expressed that they have influence in determining goals in projects; such goals were strongly aligned with those more important to the organisation they belong to, namely, increasing sales, increasing market size and achieving market targets. Examples of this were roles that were focused on supporting innovation in packaging from a marketing point of view; that is, innovating packaging through adding value in the form of using material and packaging format for differentiation against competitors. One of the main activities in which this type of role engages is looking at emergent trends in packaging materials and formats as well as consumption patterns (wants and desires). Another two components of this role are dealing with branding and advertising issues, which focus on the strategic communication aspect; and the commercialisation of packaging. Interviewees mentioned that packaging innovation is an area that generates the bulk of their sales and there was therefore a clear awareness that there is a specific area dedicated to this work, and that this department receives a great deal of support from human and material resources. This area is positioned at the front end of the packaging process, which means it is not related to the manufacture packaging. Therefore, these roles were characterised as working independently, setting up goals for others to accomplish, and within these roles there is little interaction with others from other areas or departments.

There were other roles that tended to be defined by working with others in resolving situations in which all are involved. The responsibilities that they have are generally broad and might be adapted to the situation they are dealing with. There is usually someone that leads the objectives and the ways of achieving them; less frequently, the goals are set up by the mutual consent of those involved and the ways of achieving them might be negotiable. In these instances, the ways of achieving set goals might be flexible and take into account balancing the interests of all concerned. An example of such roles is those involved in implementing projects or project management, which deals closely with the design, marketing and environmental areas, and generally such dealings are undertaken separately. Other examples of this characterisation are roles that consult in the design process externally; they described it as important to work with all those involved, simultaneously and from the beginning. The goals are, in most of the cases, defined or redefined by the consultant, and the means for achieving the goals might be unusual or radical. In these instances, it was emphasised that one important element of their roles is being proactive and having a deep understanding of the situation they are dealing with in order to give appropriate direction and advice at the strategic level.
Other roles were involved with tasks related solely to the development of packages physical configuration. In the majority of these instances, the responsibilities of interviewees were limited to translating the requirements of a packaging brief written with very specific goals for materials, format and functionality, and mainly based on marketing objectives. In a few others, some freedom in terms of the interpretation of the brief is allowed as long as it results in cost-downs. In other instances, those who described their role as being involved in the design process dealt mainly with the technical issues of packaging materials; developing new concepts or working on existing ones, resolving issues of manufacturing; and, on some occasions, addressing the environmental issues concerned with packaging materials, which according to interviewees are frequently driven by marketing objectives and cost-downs. Some clearly stated that their role was focused on ensuring that an environmental strategy was considered in their products, that is, ‘making’ their products ‘sustainable’, which was defined as having a recyclable product. In few instances, it meant printing recycling content on packages or light-weighting and dealing with the structural issues related to this. These objectives were in many cases driven by compliance with packaging regulation; they seldom were explicitly described as driven by a sense of corporate responsibility. In other cases, responsibilities of this role include investigating new and emerging technologies, as well as making sure that there are strategies in place to comply with relevant regulations.

Other roles were defined as being exclusively in charge of providing support for compliance and environmental improvement, in both organisational practices and operations as well as in packaging products. In these instances, interviewees expressed that they have authority in evaluating situations to propose goals, and in setting strategies to achieve those goals. They also mentioned that part of their role involves frequently meeting and talking to others, so they are able to get a better understanding of the design situation. Further, they noted that the types of situations they deal with are different and that every case requires different measures; therefore, their role entails a process of constant learning.

On the other hand, when interviewees further discussed their responsibilities they predominantly referred to their organisations’ structural hierarchies. They were either described in terms of reporting relationships or by making reference to the functions embedded in their job titles. Examples of this include interviewees referring to their responsibilities, sometimes implicitly and at others explicitly, in relation to the stage and degree in which they are involved in packaging design decisions. However, no details of how responsibilities are distributed or what interviewees have to do to discharge their responsibilities were discussed. Rather, interviewees focused on providing a succinct
depiction of ‘who is responsible for what’. This paradoxically resulted in interviewees discussing responsibilities that had not been assigned responsibilities that had been wrongly assigned, or which of them had been overloaded with responsibilities. More specifically, consultants and experts on specific areas, such as design, packaging materials and environmental plans and strategies, defined their roles in terms of the influence that they have on the processes and outcomes of packaging based both on their knowledge, and the close relationship with other experts or parties who have a great level of expertise. That is, they based the significance of their roles in their knowledge and their ability to set direction rather than on their hierarchical position.

In a few instances responsibilities were characterised based on the position that they have in and in relation to society. That is, in some cases there is an understanding that their responsibilities go beyond the ones they have at the organisational level, and a demonstration of awareness that the decisions they make through their practice have an effect on society too. The significance of this characterisation is that interviewees position their responsibilities not simply as serving a function within an organisation, but also in terms of trying to balance up organisational purposes with personal or social ones.

5.2 Actualities of the setting and character of design and its practice

Three recurrent themes from the three sets of data on interviewees' roles, responsibilities and involvement in design practices were found. They were coded around three main elements:

1) nature or character of the role;
2) ways of handling the role; and,
3) paths of action.

Such coding resulted in further identification of patterns or concepts. Concepts (refer to Section 4.3.2) derived from data are abstracted from time, place and people. As for the nature or character of the role three variants were found according to interview responses: restricted; adaptive; and initiatory. In terms of the ways of handling roles, three variants were found according to interview responses: prescriptive; purposive; and moving away. Among the paths of action, three variants were found according to interview responses: predictive; influential; and exploratory. Figure 5.4 illustrates these three recurrent themes regarding the roles of interviewees, their involvement in design decisions and interactions in design practices, and introduces the generated concepts:
In Section 2.3.2, Schön’s (1983) reflection-in-action view of professional practice was reviewed in relation to design practice. It was discussed that in his book *The Reflective Practitioner*, Donald Schön (1983) uses the concept ‘frames’ in terms of how practitioners might be framing their roles and problems and as a result how their actions are set in specific ways. He further explains how a practitioner might become aware of her/his ‘frames’, and with that came the possibility of changing the reality of her/his practice and its associated dilemmas. This is the reason why Schön refers to reflection-in-action in professional practice as the internal discussion that a professional goes through when confronted with the alternative frames, values and approaches to practice in which s/he can move. However, Schön fails to explaining what types of frames are available for practitioners; what properties they have; and more importantly how it is possible to move across them. It was established that in Glaserian GT, the literature becomes relevant only once it has emerged from the data. In this way, the already existing concept of ‘framing’ from Schön’s work became relevant to this research after the analysis of interview data. Building upon the framing concept, three subsets of propositions grounded in the three recurrent themes from the data reviewed in this chapter were generated, and are named *Frames of reference*. In the following sections, three variations of the *Frames of reference* proposition are explained.
5.3 Design practice as a Frame of reference

Interviewees’ roles and responsibilities, involvement in design decisions and interactions with others in design practices were reviewed in Section 5.1. Three recurrent themes were identified in Section 5.2. Three propositions that characterise the elements of interviewees’ roles and responsibilities, involvement in design decisions and interactions with others in design practices have been denominated Frame of reference in three variations:

a) fixed Frame of reference (Figure 5.5, Section 5.3.1);
b) flexible Frame of reference (Figure 5.7, Section 5.3.2); and,
c) versatile Frame of reference (Figure 5.9, Section 5.3.3).

The proposition of design practice as Frame of reference portrays the set of ideas that one has to interpret in order to assign meaning to design practice. Frames of reference alludes to the set of beliefs and perceptions that those involved in design practices take on to interpret their own reality, regardless of their level of awareness or intentionality. A point to note in the fixed Frame of reference is that it disregards the organisational hierarchy of roles. Each of the three Frame of reference propositions carries with it theoretical explanations of the setting and character of packaging design practices in the AF&BPI, based on interviewees’ perceptions. Three elements characterise each Frame of reference and are: nature or character role; ways of handling responsibilities; and paths of action (see Figure 5.4). These elements are organised around the recurrent themes grounded in the data and are related to interviewees’ main concerns and their ways of resolving them, as depicted in Figures 5.5, 5.6 and 5.7.

Each Frame of reference is discussed separately in the following three sections, accompanied by the corresponding data used in the coding process. The coding process of the data is exemplified through the inclusion of selected edited extracts from the interview data, showing the progression from comparing the extracts of data to each other, identifying recurrent themes that were then coded, and which, in turn, led to the identification of patterns to develop the final propositions.
5.3.1 Fixed Frame of reference

The analysis of the interview data, from which the larger proposition named **fixed Frame of reference** was generated (Figure 5.5), is presented here.

- **Innovation manager**: look after projects across bottles and cartons; responsibilities on cost-downs, new products, new materials.
- **New product development**: constantly working on our existing products trying to improve or trying to make them more cost effective; constantly looking at supply issues; looking at the way we produce our products and seeing if we can refine to pull as much cost out of supply chain; looking at different areas, some swapping around depending on where the demand is.
- **Manage packaging innovations solutions**, any renovations and innovations projects that might come from the factory or from marketing; specifications; looking at available materials for new products.
- **Managing new own projects**: trying to increase the post-consumer material content; improve the quality, top load performance, overall structure and integrity of packaging.
- **Looking at new innovative materials, design & process solutions**: broadening offerings specifically through cross-divisional innovation.

**Figure 5.5** Example of coding process for fixed Frame of reference
Three concepts/patterns that define a fixed Frame of reference were drawn from the recurrent themes in interviewees’ perceptions on their roles and responsibilities, involvement in design decisions and interactions with others involved in design practices. These three concepts are named: restricted, prescriptive and predictive.

The concept of restricted is based on the belief that a role mainly engages in solving well-defined problems, generally formulated by external influence. There is an element of unawareness as to why actions are performed; thus, specific actions are performed without an explicit understanding of why they are being taken. The prescriptive concept relates to the limited ways in which roles are understood and handled, that is, little or no consideration is given to whether its intentions or purposes have been appropriately established. Paths of action are thus predictive: limited directions for arriving at a predetermined ‘solution’ which carry an element of certainty or expectedness. A responsive approach is taken; since this role is set to problem solving, the main concern here is to arrive at a solution based on the information given, and tasks are repetitive. The latter reinforces the belief that this role has limited influence for changing or challenging its own intentions or purposes. Interactions with others are limited since the situations they engage in are ones of problem solving formulated by others for them to arrive at solutions focusing just on the outcome.

According to the restricted, prescriptive and predictive characterisation of a role, it can be said that a fixed Frame of reference has been adopted. That is, there is a fixed way of framing a situation in which the possibility for moving away from the known or questioning the way a problem has been formulated is limited. As previously established, a Frame of reference refers to how interviewees position themselves in a design situation and act accordingly, whether they are aware or not of it. The actions, decisions and interactions in a fixed Frame of reference seldom are considered to have an effect within a broader context of practice.

Figure 5.6 depicts the elements of a role when a fixed Frame of reference has been adopted. The grey square represents the restricted nature of the role and the red circle symbolises the fixed position of the person adopting this Frame. The dotted lines denote the limited and predictive directions for arriving at a solution, resulting in the prescriptive ways of handling this role.
Having defined the fixed Frame of reference proposition, instances from the interview data that exemplify it are presented below. It is important to clarify that some examples cover only one of the three aspects of the fixed Frame of reference, whereas others cover more than one.

An interviewee whose organisational role was at a managerial level defined their role in the following way:

*I look after all cartons and bottles for the company. This involves management of projects, cost-downs, new products, innovations in materials across bottles and cartons.*

**Packaging Manager / Brand Owner**

The main concern of this role is defined in terms of tasks focused on products. It is on the tangible character of products that the fixed nature of this role relies. The approach taken to handle the role is to constantly focus on the modification of the physical aspects of packaging. The paths of action in this role, therefore, are related to ‘arriving to a solution’ either through experimenting with innovations in materials, through developing new products or through cost-downs, a factor which translates into reducing the amount of materials that are used in the material division of the organisation. Despite the fact that this role is a managerial one, and thus in terms of hierarchy is among the higher levels of the vertical dimension (see Section 3.3), the ways of handling this role are limited by the well-defined tasks that must be dealt with. Roles that pertain to a fixed Frame of reference are, therefore, given meaning by those who perform them, and not externally.

Another example of the fixed Frame of reference is a role defined as being specialised in providing solutions; in this role, the focus is put on a very particular aspect of packaging:
I’m a packaging consultant [...] I work with a group [...] trying to take some of their materials and get them used in packaging applications [...] suggesting to them where [they] can be used. How can they get it approved for use? I do almost anything [...] my expertise is in plastics.

Packaging Consultant / Consultancy

In the example above, the role is fixed in terms of possible actions as it is predefined externally by the organisation seeking advice on a problem predefined by them, namely finding uses for their materials in packaging applications. Its paths of action are therefore restricted, as the aim is to suggest possible uses for those materials. Implicitly, the role is delineated as ‘problem-solving’, as discussed in Section 2.1.1. Such a problem is generally formulated by others.

The procedure for solving a problem is to match a set of predefined ‘conditions’ to a predicted end. The implication of this is that the tasks undertaken in this role are done in a prescriptive way. This role is concerned with achieving an outcome through a process of synthesis based only on available information, in this case the type of material to be used in packaging applications. Therefore, in this situation the expertise that the role requires is based on achieving an outcome without further reviewing the formulation of such a problem. The central issue of this is that the role becomes passive, in that the person undertaking that role is receptive only to outside influences.

Other roles were defined as including more than one responsibility. While the range of responsibilities can be unlimited, the role can be seen as having limited input in assessing situations since every task is well-defined; therefore, it is a restricted role. Providing technical support, dealing with the specifications of packaging or being involved in generating constant innovation through packaging ‘solutions’ were among the variables that exemplified multitask roles:

I look after all the specifications in the sub-systems, making sure that they are all up and ready, looking at all the available materials when we design new products.

Packaging Technologist / Brand Owner

My role comprises new product development and packaging design and development. I support two types of customers with innovation [...] I have an innovation and development team and there are two in that team and they look after the top ten costumers between them. They interface
with the customer’s packaging innovations, such as marketing teams, directly, and their charter is to work side by side with those teams to innovate packaging, so [it’s] very much about adding value. [...] We are about improving packaging, finding packaging solutions.

Packaging technologist / Packaging Organisation

In terms of their organisational role, both roles are hierarchically at a management level and as such, their responsibilities are involved with planning and directing; yet in both cases the roles have been defined in a very specific way. The main concerns of these roles are with finding solutions and explicitly focusing on the modification of the physical configuration of a package. Then, while in their organisational position these roles are influential, they are identified as occupying a fixed Frame of reference by their performers, who defined their ways of handling the role and the paths of actions as restricted and limited.

Other roles were defined as directing the resources, actions and processes in a packaging project; in these cases the focus was put on the execution and completion of projects as a whole, in a prescriptive way:

Packaging development is probably the best description [of the role]: it encompasses new product development, we are constantly working on our existing products to try to improve them or try to make them more cost effective or things like that. And there are also supply issues that we are constantly looking at. So [that means] looking at the way that we actually produce our products and seeing if we can refine that to make that more efficient... So we just pull as much cost out of supply chain as possible [...] looking at different areas generally speaking but we do some swapping around a little bit, depending on where the demand is.

Packaging Technologist / Brand Owner

I am involved in project meetings, resolving issues for the factory or the customers, developing new ways to add value for the consumers or customers.

Packaging Technologist / Brand Owner

My role involves leading the packaging group. The number one priority is serving the packaging that is in the New Product Development program... basically inputting product concepts and taking them all the way from an
idea through to being manufactured in the factory and managing the packaging development aspect of the process from idea to implementation.

Packaging Technologist / Brand Owner

Some roles experience an overlap, being both restricted by having to look at technical aspects, and focusing on the achievement of more general objectives:

The other aspects of the role go across technical support for the factory. We also have a technical input to the National Packaging Covenant reporting within the business, which is done by the environmental group, but we obviously have a fairly strong role in that.

Packaging Technologist / Brand Owner

I am in the Research and Development area, which involves being able to look at a new idea to identify which technical risks you need to test for. I’m also in charge of resolving technical issues for the factory or the customers […]

Packaging Technologist / Brand Owner

How can green design be incorporated into the way that we actually design? [I’m] coming at it from two angles: from the branding point of view, so how to make some more money by selling products and designing new products; and also help[ing] customers to make sustainable choices.

Marketing Manager / Packaging Organisation

Yet again, a problem-solving approach is taken within these roles; in each, the general goals, objectives or results have been previously defined and the role is limited to ensuring their achievement. In focusing on the achievement of general objectives, these roles include the task of identifying issues in a project, yet the variable elements of these situations, such as objectives, periods and paths of action, are prescribed or fixed. The purpose of the role is to be a means for coordinating actions in a passive way, accomplishing outcomes defined by another party. Other tasks identified as relating to this prescribed or fixed way of doing things, in which objective and outcome are already defined, included dealing with cost-downs; looking after renovations or innovations in packaging solutions; and looking at the available or new materials that could be used in design propositions.
To sum up, in a fixed Frame of reference the role’s nature is such that the tasks are predetermined and therefore restricted. As a result, ways of handling a role are prescriptive, therefore limited; paths of action are predictive as the performer of the role is required to arrive at a predetermined solution.

### 5.3.2 Flexible Frame of reference

The analysis of the interview data, from which the larger proposition named flexible Frame of reference was generated (Figure 5.7), is presented in page 137.
The larger proposition named **flexible Frame of reference** was generated to represent interviewees’ perceptions on roles that are influential and adopted in situations in which the goal is to ‘improve’ or ‘remediate’ an issue. In some cases it is also adopted to introduce a new way of doing something. Three concepts/patterns that define a flexible
Frame of reference were drawn from the recurrent themes (refer to Figure 5.7). These three concepts are named: **adaptive**, **purposive** and **influential**.

The concept adaptive refers to the nature or character of a role delineated in terms of being receptive to understanding a situation and being aware that something needs to be modified or altered in order to achieve a desirable situation. The purposive concept refers to ways of handling the role and ways of dealing with an existing situation in which there is an intention to find options to improve something. The roles are outlined as purposive and premeditated since they are concerned with how to achieve or find a missing element as a result of having a certain understanding of the situation. Therefore, those engaged in these roles are consistently looking to achieving the somewhat defined objective ways to bring in a transformation, based on what is expected to be improved in the existing situation. The paths of action pertaining to a flexible Frame of reference involve interaction with others with the purpose of setting directions and/or influencing decisions based on their interpretation of the situation; there is a level of awareness of the influence that they might have in the means and approaches by which objectives are achieved. The paths of action in this flexible Frame of reference might be thoughts or actions or a combination of both. ‘Thoughts’ refer to the instances in which ways of performing a role are concerned with proposing, counselling or negotiating; they might prevent or correct a problem. ‘Actions’ refer to responsibilities that involve the translation, configuration and execution of such ideas. These paths of action can occur at the beginning or in the final stages of a given situation.

**Figure 5.8** depicts the elements of a role when a flexible Frame of reference has been adopted. The grey square represents the adaptive nature of the role and the red circle symbolises the flexible position of the person adopting this Frame. The dotted lines denote the adaptive and influential character of setting directions towards finding options, as a result of the purposive ways of handling this role.
In some instances, a flexible Frame of reference might involve flexibility in thinking about a situation and, therefore, about how to resolve it; from this it follows that considering options, making or influencing decisions, changing focus or correcting a course of action are the ways of handling the role. The relevance of a path of action in this Frame of reference is that it is determined by the given situation, but is chosen by the performer. In a flexible Frame of reference, different alternatives for dealing with a situation can be identified based on the performer of the role’s own knowledge, as opposed to being based on evaluating the issues that are creating the situation. Roles that pertain to the flexible Frame of reference are delineated in a more oblique and open way than those in a fixed Frame of reference. The performers of these roles tend to make decisions that might directly influence the design of packaging.

In a flexible Frame of reference, roles are concerned with actively responding to a situation, meaning that the performer of that role has a conscious intention to do so. The approach to dealing with situations in this Frame of reference is flexible. For example, in roles that deal with a situation related to compliance with regulations and the improvement of processes, purposive and intentional paths of action, such as planning strategies, are required.

The approach also requires interaction with other individuals involved in the process, as actions taken for compliance affect others. These situations also require flexibility in ways of doing things. In this case, that flexibility is represented by involvement with others, managing compliance and environmental improvement in operations in the company’s sites and planning strategies for getting involved in how to support our products; making sure that they are sustainable, environmentally friendly and recyclable; working with the sustainability services division to implement collection systems for all industrial packaging, so that it can be recycled.

Environmental Manager / Brand Owner

As this data demonstrates, the focus of this role is at product-level, yet the main concern is defined in terms of working within a larger situation, co-operating with other roles, and as such the role is influential.

Another example of a role that operates in a flexible Frame of reference involves situations in which the concern is ‘how’ to carry out a task. In these situations, there is an intentional
purpose of identifying options which might require changing the focus while performing a role, and as a result this performer might influence decisions based on their own knowledge. The following role is defined as follows:

I project manage the design of major projects; that means that I am working with the designers to implement projects that take a bit longer for the sales people to actually manage, normally projects that turn out to be over 6 to 12 months. I also deal with the other marketing activities and work closely with the sustainability business [...]  
**Marketing Manager / Packaging Organisation**

This data exemplifies the many different situations involved in a role pertaining to a flexible reference role; it also demonstrates the flexibility required in dealing with those situations, as each of them differs depending on contextual factors.

The design process is one of analysis and synthesis, and a process in which many decisions are made. That is not to say that all decisions have the same importance or relevance. Yet, certain decisions directly influence other decisions made throughout the design process and, as a result, they can determine the direction of the design ‘proposition’ or design ‘outcome’. In a ‘decision-making’ situation, a decision is a response to a situation that is composed of three parts. First, there is more than one possible course of action under consideration in the choice set. Second, the decision-maker can form expectations concerning future events and outcomes following on from each course of action, expectations that can be described in terms of degrees of belief or probabilities. Third, the consequences associated with possible outcomes can be assessed on an evaluative continuum determined by current goals or personal values.

A performer of this role might thus intervene in more than one situation and at various moments during the design process; similarly more than one role might be involved in each decision-making situation. For example, in a role that involves providing alternatives for an outcome that is not predefined, a certain degree of assessment of each alternative is required by both the individual that offers the alternatives and the one that makes the decision:
I am a designer and I’ve been researching in sustainable design for the last 10 years. So, when people approach us with a project we talk with them to understand what the issues are in a product in terms of sustainability, and then provide alternatives for the client [...]

**Designer / Academic Institution**

Another example of a decision-making situation is set out below:

I work as a consultant basically working with industry, government and designers. The focus is put on product-oriented environmental policies and product design advice and product stewardship strategies. My role involves improving the environmental performance of products, either through technical guidance and advice on commercialisation and design of manufactured products, or at the strategy level.

**Environmental Consultant / Consultancy**

From both sets of data above, it must be understood that problems have solutions and decisions are made based on given alternatives. Both, however, are based on, or arrived at as a result of, available information. The difference is that in problems the information comes from an external source; in decisions it might be a combination of external information and own knowledge. Another example of a role with a flexible Frame of reference is one that deals with situations that can be approached in different ways:

*My role includes idea generation, product development and project management. [I] set up a proactive design [and] come up with many original design concepts, rather than waiting for the customer to come to the company. [My role also includes] reducing cost from the production point of view: reducing materials, light-weighting and so on. I have spent a lot of my personal time in coming up with ideas that I think might be better for a packaging solution.*

**Designer / Packaging Organisation**

A situation in which initiating change defines the role might require flexibility to deliberately choose a different way of thinking about something or doing it. An essential component of such a situation is the analysis process undertaken at the beginning; this directly influences the resulting outcome, which is not a predefined but a desirable outcome.
From the above, it can be assumed that where the purpose of the role is to ‘initiate change’, this can be done by posing design questions and through an analysis process of initial evaluations; this process of research and utilisation of knowledge leads to the arrival at a non-predefined but desirable outcome. Another example of this situation was expressed as follows:

We work as the type of designers who are at the beginning of the product design process. We are working together with marketing [professionals] and engineers, so we consult [throughout] the whole process. We are even involved in the decision of what product a company should put on the market, by reflecting on what type of contribution a given solution has in society.

Sustainable Design Consultant / Consultancy

To summarise, the main concern of roles in a flexible Frame of reference is the variability of the nature of the role as a result of that role being responsive to the situations presented. Ways of handling these roles are purposive and intentional; paths of action are flexible and defined by the situation, and are understood in terms of setting a project’s direction or influencing decisions.

5.3.3 Versatile Frame of reference

The analysis of the interview data, from which the larger proposition named versatile Frame of reference was generated (Figure 5.9), is presented in page 143.
The larger proposition named **versatile Frame of reference** was generated from the analysis of interview data (refer to Figure 5.9) that represented an evolved variation to the flexible Frame of reference. Three concepts/patterns that define a versatile Frame of reference were drawn from the recurrent themes, and three concepts were developed: **initiatory, uncertainty and exploratory**.
The *initiatory* approach for forging relationships between possible variables taken in this role allows those in this *Frame* to define a problem. They are aware of their position in a situation and act with an intention once they have reflected upon it. There is an element of *uncertainty* as to what actions need to be performed, since it is necessary to move away from assumptions and expectations. The exploratory character of the role refers to the capability to be open to possible ways of action, in which the intentions and purpose can be challenged and modified. The ways of handling this role are based on thinking and reflecting to reach a level of certainty in what to do. Paths of action are thus inquisitory; their views are based on in-depth investigation, either through the researching of documents or by engaging in conversations with others involved at various moments throughout the design situation.

*Figure 5.10* depicts the elements of a role when a versatile *Frame of reference* has been adopted. The grey square represents the versatile approach to the role and the red circle symbolises the capacity of the person adopting this *Frame* to move away from assumptions. The dotted lines denote the exploratory character of the role, in which thinking and reflection are important elements in defining the paths of action. There is also an element of uncertainty in the ways of handling this role.

![Figure 5.10 Depiction of the versatile Frame of reference](image)

A versatile *Frame of reference*, though, allows those involved to enter into a situation to change it based on a detailed revision, which includes conversations with others involved in order to understand their motives within a situation. This element can be demonstrated by the two following descriptions:
I manage the research and design team, so that is all the anthropologists, psychologists, cultural studies, interaction designers and ergonomists. We work together in projects of product design and innovation.

**Design Consultant / Design Consultancy**

I am working much more as a designer who is at the beginning of the product development process. We work with marketing, with the engineers; we are trying to consult [throughout] the whole process. Of course this type of design has much more impact than the one that is at the end [of the process]; [it] just makes a nice shape.

**Design for Sustainability Consultant / Design Consultancy**

Others positioned themselves outside of the industry; in doing so the relevance of them entering into a situation is that they do not hold the same assumptions as those already involved:

*My position in relation to the industry is being on the outside of the industry, more as a consultant, so I might come from a different point of view.*

**Design for Sustainability Consultant / Design Consultancy**

In these instances it is also possible to see that interviewees are aware of the importance of being part of the situation from the beginning and throughout its duration. Such involvement is an essential part of the versatility of this Frame of reference, since it allows for the defining of objectives and ways of achieving them. That is, through these interactions with others, it is easier to explain the reasons for the course of action in a given situation, which in some cases might include radically changing decisions that others have made which, again, will radically change the ways of doing something. Below is an example in which an interviewee discussed the great influence that they have in terms of decisions in a design situation:

*My role is to develop or re-develop products or brands in three steps: the first step is the inside or positioning step, where we find a client’s or organisation’s capabilities, aspirations and resources and look at the marketplace, and find a gap in the market that can be fulfilled as reasonably well as anybody else, preferably better, but at least as well, and that determines the brand essence of the product concerned.*

**Brand consultant/ Brand consultancy**
While in this instance the interviewee moves to some extent away from the preconceptions and assumptions of what is needed in a given situation, most important is that they portray decisions as based on an in-depth investigation of the situation.

In other instances in which interviewees discussed the extent to which their role influences objectives and decisions, a key feature was the competence to step out of their Frame of reference to drastically move away from usual ways of achieving objectives and suggest completely new ways of thinking and going about design:

...[we] are [even] involved in the decision of what kind of product a company shall put on the market: so what kind of solution does it contribute to? And then of course as a designer you can have more impact, you can really talk with marketing people from management, you can really ask them: “hey maybe there is a sustainable solution that is economically interesting at the same time, and maybe you can change your offer to the market so that it’s a totally different kind of design”.

Design for Sustainability Consultant / Design Consultancy

It’s a question of changing the frame of reference of the understanding of investment.

Design for Sustainability Consultant / Design Consultancy

Another aspect of the versatile Frame of reference is the uncertainty of paths of action in which the role is conducted, since before making any decisions on how to enter into and operate in a situation, there is a need to exhaustively examine such a situation; this might mean defining what the real problem is. An example of this is below:

[In] a lot of initial evaluations, [there is] a considerable amount of research before one starts actually posing design questions and that research dictates what happens thereafter.

Design for Sustainability Consultant / Design Consultancy

Equally important to the versatile Frame of reference, in terms of ways of handling this role, is that it involves asking questions, reflecting on actions that have been taken and the reasons for them. Since there is an element of awareness of the impacts that decisions might have in a broader context, those in this role characterisation go beyond the information available in order to understand the issues in a holistic way:
From the beginning [one has] to look at the relation very much between
the object to be packaged and the packaging itself as an integrated
problem in terms of sustainability, asking questions and understanding
what type of function a package is serving.

Design for Sustainability Consultant / Design Consultancy

In summary, in a versatile Frame of reference the nature or character of the role is
described as capable of intentionally turning from one situation to another. This occurs in
such a way that those occupying this Frame are deliberately there to define the
objectives as well as to explore ways to achieve them. In terms of paths of action, these
roles are able to deal with the uncertainty resulting from exploring new ways of looking at
a situation and, therefore, of going about it. They ask questions and reflect, and are aware
of the influence that their actions might have in a broader context.

5.4 Moving across frames

The three sets of data analysed here were based upon the proposition denominated
Frame of reference, which is used here to theoretically interpret roles and responsibilities,
involved in design decisions and interactions with others in design practices. Following
this, the framework created around these sets of beliefs, values and assumptions is used to
explain the actions of those involved in such practices. Each of the Frames of reference in
which individuals operate is depicted simultaneously in Figure 5.11, which assists in the
elucidation of the discrepancies between them.

![Figure 5.11 Abstraction of the three Frames of reference of design practice]

A Frame of reference, as a theoretical conceptualisation of design practices, is useful in
that it allows for the depiction of the character of roles in terms of movement. This
movement refers to the ways that practitioners position themselves in a particular design
situation as opposed to physical motion. The *Frames of reference* established here are self-imposed by those involved in the design practices; therefore awareness and intentionality are distinctive aspects of each variant of the *Frames of reference*. The level of awareness and intentionality varies once a *Frame of reference* has been adopted; actions and thinking processes are delineated by it. Roles in the fixed *Frame of reference* are static; those which are flexible are active; and those which come under the versatile variant are proactive.

An in-depth discussion on how the *Frames of reference* can enable strategic change for packaging sustainability is undertaken in Chapter [9]. In Section 9.2, the *Frames of reference* proposition is discussed to give answer to research question [A] which refers to identifying the current setting and character of design, and how design practices are conducted within the organisational context of the AF&BPI.
Chapter [ 6 ]
The idea of packaging and its validation

The history, evolution and contemporary role of packaging for food and beverage products, as well as drivers for trends and innovation were presented in Chapter 3. This chapter presents and discusses interviewees’ responses to issues that give answer to research question [ B1 ] (see Figure 4.6):

What is the role of packaging and what factors influence the changing configurations of packaging?

Interview data relating to two questions from the interview schedule (interview questions 4 and 5, appendix A) are reviewed here and are organised into the following sections:

Section 6.1 presents a diagram with primary interview data pertaining to the diverse perceptions, beliefs and interpretations on the current role of packaging according to interviewees (interview question 4). This is followed by a description of its content.

Section 6.2 identifies and discusses the recurrent themes from this set of data with a view to introducing two emergent concepts. It also presents a diagram depicting the coding process for each of the two concepts, followed by the discussion of each concept and supported by interviewees’ quotes.

Section 6.3 reviews a range of intrinsic and extrinsic forces that, according to interviewees’ insights, drive and influence both packaging near-future trends and packaging innovation, which are, in turn, considered to determine the configuration of packaging (interview question 5).

Section 6.4 introduces six recurrent themes that lead to the development of two core concepts through the analysis of interviewees’ accounts of this twofold interview question. It also presents two diagrams depicting the coding process for each of the two concepts, followed by the discussion of each concept and supported using interviewees’ quotes.

Section 6.5 gives a summary of the chapter in the direction to answer to research question [ B1 ] which is further discussed in [ part c] Discussion and conclusion .
6.1 Packaging’s role: a matter of expectations

Chapter 3 discussed key events and social changes throughout history that have shaped the way foodstuffs are packed, traded and consumed. Packaging has been frequently regarded as having an important role in ‘modern’ societies. Its use for foodstuffs and beverages has increased due to significant social and economic changes in the last two centuries. On the other hand, in recent decades the use of packaging has also been perceived as a major contributor to the degradation of the environment, through pollution, waste and litter, as well as a principal user of material resources.

To understand the degree of importance to which the current role of packaging is given, it is necessary to engage with a most fundamental question; i.e., does this product require packaging and if so, why? Asking these questions might appear elemental and their answers might be perceived as obvious. However, substantive presuppositions have to be made about what the role of packaging actually is in order to even pose such definitional questions. A main consideration that delineates the role of packaging is that there is in fact a product that needs to be packaged. In addition, acknowledging interviewees’ perceptions on the factors that influence the configuration of packaging is important to explain the existence of packaging in its current form. These two sets of data are related to research question \([B1]\) as illustrated in Figure 6.1.

![Figure 6.1 Relationship between interview questions 4 and 5 and research question \([B1]\)]

The current section reviews interview data collected regarding the current role of packaging (interview question 4, appendix A). Interviewees’ perceptions show a wide range of perceptions and beliefs with differences that were often paradoxical. To illustrate interviewees’ responses, a summary of condensed responses to their perceptions regarding the role of packaging is presented in Figure 6.2.
Figure 6.2 Summary of condensed responses to interview question 4 on 'perceptions regarding the current role of packaging'

Figure 6.2 shows that an emphasis was consistently put on justifying the use of packaging by highlighting the various purposes that it has been set to fulfil, by and for the food and...
beverage industry. What is noteworthy is the fact that those involved in the design of packaging take its existence for granted. This made it complicated and at times difficult for interviewees to articulate packaging role in an explicit way. There was, nonetheless, embedded in their responses a general belief that packaging plays a significant role in moving food products through various points along a supply chain to make them accessible to consumers. The meaning of ‘role of packaging’ was commonly associated with the nature of the particular distribution and trading scheme of foodstuffs, specifically transportation and merchandising. This section introduces the four key roles of packaging drawn from the interview data:

1. Fundamental role
2. Technical role
3. Merchandising role
4. Multi-purpose role

The current role of packaging was commonly defined in terms of being fundamental and integral, based on its capability to perform various functions. The latter was mainly related to the perceived capability of packaging for containing the product and ensuring its integrity, which is understood as getting the product to consumers in optimal condition. Some interviewees went as far as to say that the role of packaging has become more important and it has been increasingly recognised as such. This significance was related to packaging enabling product success, namely increasing sales. To do so, interviewees perceived that it was necessary to come up with a packaging design process that allows both delivering consumer benefits (for example, usability and openability), and the provision of environmental benefits (that is, extending the product’s life, avoiding food spoilage and minimising food wastage).

The current role of packaging was thus perceived as fundamental and the various functions included here are:

- containment and protection of the product to ensure the integrity and quality of the product;
- enabling product success;
- consumer benefits; and
- environmental benefits.

Despite the perception that the current role of packaging is fundamental, there were those who questioned and, to some extent, put under scrutiny the very existence of
packaging. While they remained moderate, interviewees’ major arguments centred on the amount of packaging materials used and on issues of end-of-life management choices for these materials. For example, references were made to the importance of keeping packaging materials at the ‘right amount’ and the level of consumer acceptance was considered a principal indicator for estimating what amount of packaging was adequate. Some suggestions were also made as to the alternative of eliminating packaging altogether when possible; however, those interviewees who made these suggestions acknowledged that for it to happen in the majority of products, the current distribution system needed to undergo some changes.

Interviewees deemed packaging as necessary only when it was essential to the product, such as when packaging performed technical functions enabling product distribution and transportation. Among these functions were protection and distribution of food and beverage products through various stages along the supply chain, at the lowest possible cost. It was further explained that the type of packaging needed was that which enabled the efficient distribution of products from growers and producers through to consumers. In an attempt to underline this issue it was explicitly stated that the configuration of individual primary packaging could be changed and radically optimised.

Responses can be classified into the following technical roles:

- protection and safety of the product for its distribution through various stages along the supply chain at the lowest possible cost;
- the facilitation of palletisation for efficient transportation; and
- assisting distribution considering the needs of a variety of stakeholders, for whom maximising logistical efficiencies is a main concern.

More elaborate arguments were at times formulated, in which the existence of packaging was challenged by pointing out some key variables that determine its existence; definitions around it were also challenged. According to some interviewees the existence of packaging should be defined in relation to the product being packaged.

At the other end of the spectrum, the importance of the role of packaging was also attributed to the suggestion that packaging can perform rather complex and subtle functions. In these instances, the significance of packaging was explicitly and emphatically associated with the successful merchandising of products. There was also an emphasis placed on packaging as a key enabler for the merchandising of products and ensuring product success. More specifically, characterising the role of packaging as an
essential marketing strategic/positioning tool for organisations to sell more products through retail outlets became a central topic of interviewees’ responses.

Among the roles that packaging is expected to perform from this merchandising point of view, it is possible to distinguish the following:

- enabling product presentation and display;
- allowing products to stand out and to stack better on retailers’ shelves;
- getting consumers’ attention over competitors’ products, thus facilitating product differentiation;
- serving as a medium to ‘help’ consumers in making a buying decision;
- being a means of ‘communication’ between the consumer and the brand; and,
- creating an ‘experience’ for the consumer.

The role of packaging was consistently portrayed in terms of these multi-purpose and somewhat complex roles. It is worth noting that this multi-purpose character ascribed to the role of packaging, through which marketing objectives could consistently be achieved, is subordinated to distribution and trading issues pertaining to modern food systems. Interviewees also described packaging’s role in terms of being a communication media through which the value of a product is passed onto consumers, creating an emotional attachment with consumers. According to interviewees, this results in a psychological effect in consumers that encourages them to purchase products. Interviewees described the role of packaging as an essential means for a brand to differentiate itself from others in the retail environment and, more importantly, in the consumer’s mind. The capability of packaging to provide accessibility to products was yet another role identified, with two different perspectives: a) considered in terms of consumers’ convenience; and b) the continual availability of foodstuffs in space and time to as many consumers as possible. In the former approach, the provision of consumer convenience was an attribute that interviewees referred to as important for justifying that packaging has an important role. Consumer convenience was referred to as multi-faceted: as the functionality aspects that aid consumption of the product; added value in the form of portion control and size, closure and resealability; and using and storing the product in a more efficient way. In the second perspective, accessibility can be interpreted as making a product available on the supermarket shelf, anywhere in the world, regardless of its origin or temporality.
Relevant functions related to the multi-purpose nature of the current role of packaging are:

- marketing objectives subordinated to distribution and trading issues pertaining to modern food systems;
- communication media;
- accessibility (either understood as consumer convenience or product availability).

As presented, there are a number of important roles that packaging fulfils for food and beverages and these differ amongst those involved in packaging planning and design. While some of these are differences of substance, others are no more than lexical variations. It is important to reflect on the fact that interviewees give different connotations to packaging according to their own purposes. Therefore, such characterisations are regarded as variables dependent on the belief system in which these utterances are embedded, ultimately portraying three major interviewees’ concerns. First, the role of packaging was generally assumed as important due to the context in which mainstream food systems are located. Second, an emphasis was placed upon validating the importance of the role of packaging based on the various technical functions that are delineated in relation to distribution and trading issues and accessibility. Lastly, packaging is perceived as essential to performing complex tasks, based on inferences and pre-assumptions that packaging is an irreplaceable communication interface between brands and consumers for the realisation of merchandising objectives.

6.2 Themes on the perceptions of the current role of packaging

Interviewees’ main concerns regarding the current role of packaging are discussed in the current section with a view to introducing the generated concepts based on recurrent themes. No emphasis is put on accurately describing data in relation to interviewees’ backgrounds or on capturing a representation of all possible variations. Distinctions are made based on conceptual similarities however they might relate to different issues according to interviewees.

It was possible to distinguish three recurrent themes that, both explicitly and implicitly, portray the main concerns of interviewees with respect to the current role of packaging. This selection is exhaustive of recurrent themes in responses given by interviewees.
1) The current role of packaging is assumed as essential since it is subordinated to issues of the distribution and trading context in which mainstream food systems are located;
2) The value of a product is intrinsically stressed through its packaging; and
3) The predominant merchandising character attributed to packaging validates its complex nature.

Figure 6.3 illustrates these three recurrent themes regarding the current role of packaging and introduces the generated concepts.

Figure 6.3 Recurrent themes of interviewees’ characterisation on the current role of packaging

While it is important to identify that definitional issues of the role of packaging have been considered it is equally important to note that consideration of issues of packaging’s configuration have been taken. It is more relevant to point out that the possibility of the inexistence of packaging was not reflected upon exhaustively where interviewees’ motivations and arguments for change remained limited. Furthermore, interviewees consistently reverted back to attempting to justify the role of packaging based on the belief that packaging performs important tasks throughout the various points within the supply chain.

Two concepts that portray interviewees’ main concerns when characterising the current role of packaging are named Complexity and Invariability. Definitions of these two concepts are developed and introduced in Section 6.2.1 through the use of diagrams
depicting the coding process.

6.2.1 Packaging validity

From interviewees' responses regarding perceptions on the current role of packaging, a key issue became relevant: the evident concern for validating packaging's existence. Interviewees emphasised the relationship between the establishment of mainstream food systems and the perceived fundamental functions that packaging performs within such system. Two concepts named Complexity and Invariability emerged from the interviewees' attempts to constantly validate that the current role of packaging is fundamental.

In Figure 6.4, the coding process for the conceptualisation of Complexity is illustrated.
The belief that the inherent complexity of the diverse tasks set for packages to perform is precisely the one which justifies its existence according to interviewees. Then, when analysing this set of data, the following question arose:

- Why is the idea of packaging a valid proposition? Further, how could such validity be measured, and how is it possible to ensure that
inferences made about the current role of packaging are appropriately defined?

From this question, the concept of Complexity emerged. It relates to how the arguments validate the existence of packaging in reference to the intricate relationship of the various tasks that packages are set to perform, and the intrinsic assumptions around them, which explain interviewees' ways to resolve their main concerns. An important property of this concept is that, while packaging may fulfil such varied expectations, and while its existence may indeed be justified, it does not necessarily mean packaging is the only 'means' to fulfilling such expectations. Further, it is argued such expectations may not always be adequately defined, leading to the inexistence of packaging or negation of any question of simplicity.

The concept of Invariability portrays interviewees’ notion of the unalterable, unchangeable or that which remains constant in order for the role of packaging to be justifiable. It may also refer to that which must exist or remain the same for validating the existence of packaging. In terms of the definition of the role of packaging, the implications of this concept state that certain requirements and situations are required so the role of packaging is portrayed as fundamental. The important thing to note is such characterisation of packaging is associated with its capability to contain, protect and transport products throughout a multifaceted supply chain and, more importantly, is subordinated to the setup of the **distribution and trading context in which mainstream food systems are located**. The coding process for the conceptualisation of Invariability from the interview data on the role of packaging is illustrated in Figure 6.5 in page 160.
The assumption that the nature of the distribution and trading scheme of mainstream food systems is invariable and, thus, perhaps incontestable, according to interviewees, which determines packaging's very existence. Then, another question arose from the analysis of this set of data:
Is it possible to reconfigure mainstream food systems by altering the invariable conditions in which packaging is required and, as a consequence, leave out the assumptions that packaging is necessary?

From the analysis of this set of data it is possible to identify the interviewees’ main concern: to validate the current role of packaging through focusing on issues of its Complexity and Invariability to justify its existence. Interviewees’ perceptions on the current role of packaging were presented in Section 6.1. In Section 6.2.2, quotes from interviewees are presented to illustrate the two concepts.

6.2.2 Complexity and Invariability

Acknowledging interviewees’ main concerns in definitional arguments regarding the current role of packaging allowed identifying convergent views and contradictory ones. It also allowed distinguishing points of mutual exclusion in which some roles are subordinate to others. A consideration of the issues that Complexity and Invariability bring to the validity of the current role of packaging holds fundamental lessons for packaging ideation and design.

The proposition of Packaging validity is defined by the two concepts Complexity and Invariability. Here, interview data is used to exemplify these concepts. In certain instances the two concepts overlapped; therefore, some interview data is used to exemplify the two concepts concurrently.

The role of packaging was predominantly considered as ‘fundamental’ by interviewees, and this was validated by its capacity to perform tasks related to the nature of the distribution and trading context in which products are found. The role of packaging portrayed aligned with the perceived invariable conditions of such a context in which,

packaging plays a basic technical function, [namely the] protection, containment and safe transportation of the product effectively throughout the supply chain.

Packaging Technologist / Brand Owner
Expounding in more detail, another interviewee established that,

packaging in most cases is necessary — it has some very important functions... it protects the product, it enables transportation and logistics, it gives information to all the people along the chain...

Sustainable Design Consultant / Consultancy

Others validated the role in terms of the **unchangeable conditions** of the supply chain which then requires that packaging perform a variety of functions:

In general terms, its role is to contain a product along the supply chain considering a variety of stakeholders, people involved in the manufacturing through to the end user.

Sustainable Design Consultant / Consultancy

It's a medium that efficiently makes the product go through the whole supply chain... you know... logistics...

Packaging Technologist / Brand Owner

Validity, in these instances, is also found in the **complexity** around the fact that a product moves across different physical points because of the existing trading scheme:

[The role of packaging is the] transportation of the product to consumers. [It] moves the product effectively throughout the supply chain...

Packaging Technologist / Brand Owner

Here, the emphasis is not placed upon packaging as such; instead it is placed on the product-packaging relationship and is related to allowing a product to be accessed. The property of **invariability** in this characterisation of the role of packaging then relies on the fact that within such a trading scheme there are inherent and apparently **unchangeable** rules for the way products are traded. This trading scheme is greatly responsible for validating the existence of packaging and is in fact that which must exist or **remain the same for validating the existence of packaging**. The assumption here is that without packaging many products would not be able to be merchandised. Thus, efficient transportation was highlighted as a fundamental role of packaging, following the logic of potential product damage caused during transportation:
Without packaging, a lot of products might be damaged and so you cannot sell them; but the kind of packaging that we need is the kind of system that is used to distribute products, so I think we can optimise packaging quite a lot.

*Sustainable Design Consultant / Consultancy*

[Packaging] is a medium that efficiently makes the product go through the whole supply chain…logistics.

*Packaging Technologist / Brand Owner*

[Packaging] efficiently protects a product. It gets the product in optimal condition to the consumer. [It] facilitates the transport of a product throughout the distribution chain.

*Packaging Technologist / Brand Owner*

The implication of the above is that if variations or adjustments were made to the trading scheme, this would necessitate the redefinition of the very existence of packaging; even further, some aspects of packaging may no longer be deemed valid. However, such a scheme is rarely questioned or challenged by those involved in the industry context. This in turn does not allow for a *redefinition of the conditions* that defines the validity and appropriateness of current notions of the role of packaging. An element of *complexity* in the characterisation of packaging here derives from a trading scheme where products are made in one place and are transported to another place to be merchandised, particularly, in a self-service retail context.

In other instances, the role of packaging was defined in relation to the condition or conditions that *remain unchanged* or *constrain* the existence of packaging in terms of its relationship with the product, a relationship in which the existence of the former is determined by the latter:

*I believe that the current role of packaging isn’t changing that much…because what packaging’s got to do is be a package to put something in… and the things that you put into a package are not changing too much either: […] but the drivers for designing packaging certainly are changing and some of those drivers are greenhouse gas emissions, environment and global warming and recyclability and those sort of things…*

*Packaging Consultant / Packaging Consultancy*
[The role of packaging] is very important. For frozen vegetables, it's really hard, as the product is behind the freezer door so it needs to stand out. It needs to keep the product in good condition, good performance.

Marketer / Brand Owner

…packaging plays two roles: it’s a functionality aspect and that’s... you know... it opens or closes better, it stacks better or whatever is superior to their competitors. And the other thing is an emotional attachment and that, you know, it makes people feel good.

Marketer / Packaging Company

[Packaging’s role] is to provide a functional benefit: through experiencing the product, using the product better or standing out from the shelf. [The role of] packaging is crucial in helping people in making a buy-decision; it goes beyond containing the product.

Design Consultant / Design Consultancy

By omitting the actual attributes of a product, and by focusing on the invariable conditions of the set-up of the distribution and trading system, and the achievement of commercial goals, packaging is regarded as the essential component of that relationship. Packaging takes on another dimension, becoming an indispensable part of the product. Furthermore, in their insights, some interviewees referred to packaging as ‘necessary’, perceiving it as:

a key enabler for product success [...] and for the successful merchandising of products.

Packaging Technologist / Brand Owner

In such an understanding, there is an implicit assumption that packaging is the only means to achieving such a commercial goal:

In too many categories [packaging] is used as a low-cost container.

Branding Consultant / Brand Consultancy

However, another aspect to be taken into account in the characterisation of packaging is the ability of packaging to make products available to the consumer. In this case, the use of packaging is, ultimately defined by existing situations in the broader context that
validates its role. The fact that food became a commodity in an industry that is subordinated to the demands of a changing society and packaging is used merely as a means to conduct business, the argument for its validity has economic connotations:

In organisations, the emphasis is more a transactional one: how do I do it cheaper rather than how do I do it better?

**Brand Consultant / Brand Consultancy**

From a merchandising point of view, the role of packaging was more broadly emphasised as a means to meeting more **complex expectations**, namely marketing objectives:

[Packaging] is an interface between the consumers and the brand. [It] aims to appeal to a consumer to buy... [It’s] a tool for selling more products...

**Marketer / Packaging Consultancy**

On-shelf [packaging] is the first contact the consumers have with the brand. Catch consumers’ attention...

**Marketer / Brand Owner**

Here again, issues of the appropriateness and validity in justifying the existence of packaging based on its **complex nature** are raised. For those who provided these perspectives, such a role seems to be appropriately defined; hence, achieving marketing objectives through packaging is justified. For example:

It’s the means of how a brand differentiates itself from other products in the consumer’s mind.

**Marketer / Brand Owner**

[It] contributes to product appeal.

**Packaging Technologist / Brand Owner**

[Packaging helps in] selling the product; it’s part of branding and marketing.

**Packaging Technologist / Brand Owner**

In other instances, complexity in the role of packaging is used as a means to justify its existence by aiming to externally achieve a condition that relates directly to the product
which contains, namely to ‘convince’ or ‘appeal to’ the consumer to buy this product. This is directly opposed to the perception of packaging having a role related to the enhancement or preservation of a product, such as the improvement or maintenance of the quality, flavour or nutritional characteristics of the product:

...we see a lot of premiumisation of brands through the use of indulgent packaging... in colours, materials, etc to give people that warm sense of...

“Yeah, I really do need this brand” [...] so there’s that aspect.

Marketer / Packaging Company

[Packaging] contributes to product appeal.

Packaging Technologist / Brand Owner

The role of packaging was also Framed in terms of delivering benefits or convenience to consumers through some functional features, by facilitating either access to a product, closure of the packaging, storage, consumption of contents, or functional convenience in the preparation of food. Along similar lines, there were those who believed that part of the role of packaging was to provide consumers with a ‘better experience’ of the product. According to these perceptions, ‘experiencing’ the product encompasses both the creation of an emotional attachment to the product and making consumers feel good about having the product.

The assumption that packaging is meant to achieve intangible objectives constrains and determines its own existence. That is, it adds unnecessary complexity to validate its function. There are assumptions that these expectations from packaging should be achieved through its physical configuration, either through its functionality or through its colours and shapes. However, this element of the role is established from a branding perspective, in an explicit attempt to create a need in the consumer’s mind. From this perspective, the role of packaging shifts from being a mere container for a product, to an innate element of the product itself. The aspects which were regarded as benefiting the consumer were often established through the eyes of the organisation, as they were perceived to ‘add value’ to the product and thus to sell more products. The implication of this is the importance of the commercial aspect that the role of packaging has. In these terms, the role of packaging was implicitly deemed unnegotiable or invariable, whereas other aspects, including the environmental impacts of packaging, were described in negotiable terms. This became obvious with the role of packaging being defined as ‘meeting marketing objectives’ when environmental issues were mentioned within such a role, they were referred to only in terms of their ‘consideration’:
[Packaging] contains the product in the best materials that do the job within the constraints of the factory. It must meet marketing expectations, considering environmental issues.

Packaging Technologist / Brand Owner

Packaging is quite important to keep […] there’s a big push of people saying: “why do we need any packaging at all?” I’ve worked with some companies who have minimised their packaging so much that they ended up with lots of breakages […] So the packaging is important there for the protection of the product and keeping it at the right amount for the consumer to accept that.

Sustainable Design Consultant / Academic Institution

In contrast, some interviewees who considered their own perspective to be ‘outside’ the industry and, therefore, the possibility of changing the conditions and situations in which food products are merchandised were discussed. Furthermore, the emphasis on the marketing aspects of the role of packaging was criticised and validating the role of packaging as a marketing tool was frequently deemed as undesirable:

[Over-packaging a product] is kind of missing the point of what packaging should be about. We have lots of examples of over-packaging […] but then it’s not doing the role that it should be doing.

Sustainable Design Consultant / Academic Institution

This argument was based on the fact that as a result of using packaging as a marketing tool, products were often over-packaged, or packaging consisted of an unnecessary variety of materials. In terms of adding complexity to the role of packaging so it is set to achieve marketing purposes, there was a certain level of recognition that such use may be in contradiction with the foundation of the need for packaging.

Complexity in the arguments to validate the existence of packaging was also found when ‘communication with consumers’ was considered another role of packaging that for the most part, it was regarded as a means to convey the values of the product to the consumer. Interviewees’ concerns were firstly centred on the ways in which organisations want their products to be perceived, and then, on ‘translating’ those ideas into distinctive features of the physical configuration of their product’s packaging, either through material type, colours and/or shapes:
Packaging is a communication media. It is not more than that: communication with the consumer about the values of the product.

Brand Consultant / Design Consultancy

The implication of deeming communication as part of the role of packaging is that, whether it is appropriately defined or not, there are implicit assumptions about the context and conditions in which such communication occurs. It is essential to take these contexts and conditions into account, as interviewees use them to justify the appropriateness of the packaging. This justification manifests itself in terms of creating a relationship with the consumer, and yet the nature of such relationships is, in the organisation’s terms, influenced by the retail context. In this context, the consumer may be in a position of disadvantage as a passive receiver of messages, which in turn calls into question the very nature of this ‘communication’. In other instances, this ‘communication’ was defined in terms of the aspiration of the organisation to build a relationship with their consumers:

[Packaging enables] communication with the consumer about the values of the product.

Marketer / Brand Consultancy

However, it is clear that from this perspective, packaging is regarded as the unilateral delivery of explicit and implicit ‘messages’ that are intended to transmit information about the product to the consumer. The one-sided nature of this ‘communication’ obviously constrains the understanding of transmitted information to what has been deliberately chosen. Thus, the validation of the use of a package as a means for communicating with the consumer is based on the recurrent belief within the packaging industry that packages have the capability of persuading the consumer to purchase a product, regardless of its appropriateness or the fulfilment of the goal pursued. If the ‘communication’ aspect of packaging is regarded as something that guides the consumer, this may have the effect of changing the appropriateness of its existence, as the goal becomes to inform the consumer rather than to induce certain behaviour. The most important factor to be considered in the ‘communication’ aspect of a package is that in identifying its appropriateness, communication should be consistent and truthful, and in accordance with the actual attributes of the product.

In addition, this idea of communication is highly dependent on complex issues of the graphic elements of the package, such as colour, shape, typography and sometimes
photography. It was admitted unambiguously by interviewees that these aspects exist to provoke an emotional reaction from consumers:

*The other thing is to create an emotional attachment that makes people feel good.*

**Marketer / Packaging Company**

Once again, the validity of the existence of packaging as a means of communication is based on persuading consumers to buy a product; however for that ‘communication’ to be understood as it should be, namely as a bilateral process, certain conditions are required and these, were not addressed by interviewees, who instead drew upon assumptions of their own definition in order to validate the role of packaging. They referred to the ‘communication’ aspect as an effective way of telling people that a particular product is different from another, or:

*the means of how a brand differentiates itself from other products in the consumer’s mind.*

**Marketer / Brand Owner**

Such ‘communication’ is again based on the physical appearance of a package, a situation in which the problems of definition are made clear, as in the above example.

To this point it is possible to establish that currently, assumptions about the role of packaging within the industry context refer to it as an ‘indispensable’ element in our everyday life, and in doing so the particular nature of the trading and distribution context is constantly reiterated and it is assumed as invariable. If a given role attributed to packaging ‘validates’ its existence in interviewees’ opinions, this does not necessarily mean that such a role has been ‘appropriately’ defined and, in turn, the particular use of packaging may not be the most adequate or the only means to fulfil such expectations. Thus, generally in this context, the very idea of packaging is uncritically accepted, despite the fact that concerns were expressed about the amount of materials and resources used. A package, by definition, is subordinated to the product it contains. Yet, this relationship has frequently been inverted and the packaging becomes the essential part due to its capability to merchandise products within mainstream food systems. The trading and distribution context and the accessibility aspect attributed to packaging are ‘conditions’ which must exist for packaging to be considered as fundamental. These two conditions transform the nature of packaging and also constrain its very existence.
The many tasks that are expected to be performed by packaging bring a high level of complexity in its configuration; yet, packaging could be configured in quite a simple way, transformed or even eliminated if a careful assessment was undertaken on how the type of product, associated environmental issues, safety concerns and how packaging resolves these issues, how are they defined and why. It has been already pointed out by interviewees that this would have to be done in consideration with key issues of the product’s context, particularly the distribution and trading system.

To summarise, a rather technical and logistical approach persisted in interviewees’ concerns when characterising the role of packaging that tended to relate to the distribution and trading scheme of mainstream food systems. Questions about redefining the significance and place of packaging were seldom a concern among interviewees. Paradoxically, it seems precisely to be the establishment of mainstream food systems which reinforces the need to satisfy such diverse expectations from various stakeholders with different concerns through packaging. In other words, mainstream food systems are characterised by moving foodstuffs across long distances, between points of production and points of final consumption of the product, all which is enabled by the use of packaging. These aspects are invariable and permanent conditions of such a food system. While perhaps this states the obvious, it is essential to note that it is precisely on this inconspicuous complexity of the context of the distribution and trading of foodstuffs that the perception of the indispensability of packaging relies.

The discussion presented in this section sets the preamble to the following discussion on aspects of packaging configuration. What aspects of package configuration, in terms of the idea, need to be changed or redefined? How do such aspects relate to each other and how do they differ from one another? How may they help to redefine each other? Under what circumstances could those changes occur? If a given role attributed to packaging ‘validates’ its existence in interviewees’ opinions, this does not necessarily mean that such a role has been ‘appropriately’ defined and, in turn, the particular use of packaging might not be the most adequate or the only means to fulfil such expectations.

6.3 The nature of the configuration of food and beverage packaging

In Chapter [3], it was described how the role of packaging has been determined by social, economic, cultural changes and technological advances throughout the history of civilisations. In Section 6.1, it was established that the significance of recognising interviewees’ interpretations on such a role relied on the fact that it was possible to
elucidate interviewees’ main concerns on the role of packaging which were depicted in two key concepts; i.e., Complexity and Invariability. These concepts become useful since they portray interviewees’ assumptions affecting packaging’s configuration. In other words, due to the perceived complexity of the functions of packaging and invariability of conditions surrounding mainstream food systems, interviewees hold a firm belief about the validity of the existence of packaging. Further, packaging’s long-term existence in its current configuration has been assumed by interviewees.

Reviewing issues of the configuration of packaging is relevant to identify the aspects that interviewees consider in formulating packaging design briefs and the reasons for decisions made around the design of packaging. In this section interviewees’ perceptions on near-future trends in packaging and issues driving packaging innovation are presented and discussed simultaneously.

Selected edited extracts from interviewees’ perceptions on packaging configuration related to trends for the near future are illustrated in Figure 6.6. Subsequently, interviewees’ perceptions on issues of packaging innovation are exemplified in Figure 6.7 through selected edited extracts from this set of interview data. Selections are exhaustive of themes which were mentioned by interviewees.
**packaging trends for the near future**

- lightweight / minimising packaging, down-gauging / less materials
- biodegradables / compostables
- getting out [the use] of glass and cans
- on the go / portability / convenience
- technology driving changes
- readily recyclable [packaging materials]
- downsizing: sizing changing to smaller packages [as a result of] single person households / smaller households
- retailers pushing for products to be shelf-ready
- multifunctionality / it's not only about the packaging having more functionality, but also a purpose
- at the moment, [a trend is] not the environment but in 5 years, definitely: the introduction of carbon trading
- innovation, but that which cautiously delivers real benefits to consumers
- awareness of environmental issues; people are not ready to pay yet though
- adding value
- government push
- labelling on nutrition and sustainability issues
- competitive, small market locally and globally dominated by a small number of retailers with far too much control
- globalisation: more products from overseas
- currently there is no closed loop / composting systems in place
- single resins / one type of packaging material
- [trends in] in food packaging: nutrition and organics
- considerations of sustainability issues both by organisations and consumer awareness on sustainability issues
- things are faster, the dynamics of the fmcg is going faster
- green packaging
- balance in the environmental argument
- packaging waste / litter awareness
- stand-up-packs on shelf
- demographic changes
- retailers looking for high quality generics to be differentiated
- Consumer’s perceptions: traditional quality packaging vs. new alternatives
- ready-to-eat foodstuffs
- there’s a big emphasis on not over-packaging
- carbon footprint / greenhouse gas emissions

Figure 6.6 Summary of condensed responses to responses to interview question 5 on ‘perceptions on packaging trends for the near future’
Figure 6.7 Summary of condensed responses to responses to interview question 5 on ‘perceptions on packaging innovation’
Since assumptions regarding issues of packaging configuration influence decisions made in the design of packaging, interviewees were asked to talk about their perceptions on near-future trends and drivers for innovation in food and beverage packaging (interview question 5, appendix A). Like other interview questions, this two-fold question was deliberately left open to interpretation.

Trends in packaging were interpreted as issues determining variations in the appearance of packaging based on external issues such as social, economic and technological changes; whereas, packaging innovation was associated with the variations to the appearance of packaging concerned with bringing the idea of novelty as a competitive advantage. Discussing issues regarding the configuration of packaging anticipate and involve questions of change, both in conceptual and practical levels. Yet the nature of change discussed by interviewees when ask about trends and innovation in packaging focused on changes of the practical nature, i.e., packaging physical configuration as opposed to considering change at the conceptual level, i.e., changes to the actual paradigm of packaging. The paradox of this is that packaging design is perceived as to be only involved with issues of packaging appearance, such as material selection, available technology and packaging machinery and end-of-life management issues.

In a broad sense, a major issue discussed regarding perceptions on the near-future trends and drivers for packaging innovation turned around issues of “adding value” and providing “convenience” to consumers through changing the appearance of packaging. Such drivers are based on current social changes including lifestyles and demographics including the increase of smaller households, older population, consumer awareness on nutrition and environmental issues. Adding value was mainly described in terms of improving functionality aspects of the packaging such as how the packaging is opened or how it dispenses the product. Convenience referred to the ability to provide an advantage to consumers through a specific feature of a package such as portability and portion control, smaller packs and single serves, and ready-to-eat meals. However, it was expressed that a frequent driver for doing this was cost-related and issues of the competitive nature of the market. From that perspective, another aspect of packaging trends and innovation that emerged was that related to having the “right appearance” to appeal to consumers and increase product sales. This aspect of packaging configuration was related to interviewees’ concerns that packaging helps their product to stand out on the retailers’ shelf; furthermore, using packaging to differentiate products was perceived as a trend that will continue in the long run to the extent of ensuring a brand’s longevity in the marketplace.
Other major drivers of ‘innovation’ mentioned by interviewees were cost and consideration of retailers. The former can be considered an internal driver: from the company’s perspective, it is important to find new ways to reduce cost, and this normally occurs by reducing materials, or light-weighting. The latter, in contrast, is an external influence which neither derives from new ways of delivering products nor relates to reformulating the distribution system. Such a distribution system is largely dictated by retailers, and the innovation that companies are looking for responds to the demands of that context. The innovation that was driven by retailers related to logistical issues, including transporting products to the supermarket, shelf-space, stackability or shelf-readiness which, in turn, relates to reducing operational costs and increasing profit. The innovation, then, is focused on the physical configuration of a package: shelf-space is a principal driver, but they also include materials, shape, colour, size, and ability to close.

While a particular near-future trend or innovation in packaging might be rather short-lived either in terms of its dependability on the external influences that originated it, or in terms of the accessibility to technological advancements, or in terms of social trends and lifestyles, even in terms of considering issues of sustainability, the difficulty here is that the broad idea of packaging in its current form have persisted over very long periods of time and thus fundamental questions of values attributed to packaging need to be reviewed. Finally, social and political pressures are considered a main driver for innovation. The needs, values and priorities of consumers and political circumstances are constantly changing, and organisations need to be aware of them. This concept can also be considered to include issues related to the environment and sustainability and packaging.

It is important to consider when discussing innovation that packaging is something that, in terms of its ‘useful life’, is ephemeral: once it has fulfilled its role it becomes ‘useless’. Yet, packaging innovation is an area in which great investments have been made, both in terms of money and resources. This inconsistency seems to go unrecognised among those involved in constructing ‘innovative ideas’. To be able to define what is ‘truly’ innovative, it is first necessary to reconfigure the approach of packaging towards innovation. Innovation is about having the right product for the right context; not all new materials or packaging strategies are appropriate for all products. In other word, the reasons for such changes are not always adequately addressed or even defined, and therefore, understood, by those who work with and implement them.
6.4 Themes regarding the perceptions on packaging trends and innovation

According to interviewees’ perceptions on packaging trends for the near future and drivers of packaging innovation, six recurrent themes that influence the configuration of packaging were identified:

a) changing life styles and demographics;
b) fast dynamics of the markets;
c) moving towards considering issues of sustainability;
d) creating more products and maximise opportunities;
e) growing awareness on the environment becoming a driver; and,
f) making more or different but not necessarily better.

From Figures 6.8 and 6.9 below, it can be seen that from the recurrent themes a further abstraction was made resulting in the generation of two propositions which best represent the main concern of interviewees when defining the influences affecting the configuration of packaging:

1) The next thing (Section 6.4.1, Figure 6.8);
2) More, not better (Section 6.4.2, Figure 6.9).

The coding process is illustrated in Figure 6.8 (p. 177) and Figure 6.9 (p. 178) respectively.
Figure 6.8 Coding process for the next thing from interview question 5 on ‘perceptions on packaging trends for the near-future trends and drivers of packaging innovation’
Figure 6.9 Coding process for more, not better from interview question 5 on ‘perceptions on packaging trends for the near future and drivers of packaging innovation’
The proposition named The next thing was develop to account for instances in which the main concern of interviewees was in relation to time, to speed and change when elucidating their perceptions on the influence of the configuration of packaging. Influences are either determined by issues related to packaging as such or to the context in which change, movement and speed are important for defining the configuration of packaging. The proposition More, not better denotes another preoccupation of interviewees related to change too but in quantitative terms rather than qualitative ones. That is, change is relevant if done for the sake of maximising results rather than for enhancing them for the better. ‘More, not better’ emerges as a proposition that encompasses the consideration of two elements: social concerns and external pressures as drivers for innovation.

6.4.1 The next thing

Before commencing this discussion, it is again important to note that the connotations given to packaging innovation and trends were deliberately left open to interviewees’ interpretation with the purpose of understanding interviewees' concerns. Interviewees were free to discuss any type of innovation they might think of and any type of packaging trends on issues across the supply chain. In a broad sense, innovation was commonly understood as changes with materials or functionality of packaging. Packaging trends were commonly regarded as trends in the physical aspects of packaging which were often referred to as being dictated by consumers or what retailers thought consumers want.

The concept of ‘the next thing’ is twofold. First, it deals with issues of ephemerality, namely the constant change that is pursued in the industry, resulting in an almost paradoxical perpetual ephemerality in the configuration of packaging. Examples of this are:

One of the big ones is about the... the wow factor, I mean the brand owner are starting to realise more and more that packaging is becoming absolutely critical, in the promotion of a brand because, you can have all the advertising that you want but at the end of the day, you have a split moment in time when someone is standing in front of the groceries shelves facing sixteen thousand SKU’s. Why are they going to pick your brand up? And the brand owners are starting to realise that... well you know what? A lot of it’s to do with the packaging [...]  

Marketing Manager / Packaging Organisation
The constant changes in lifestyles and demographics; smaller households smaller portions [...]  
**Environmental Manager / Retailer**

The need of consumers and marketers to have something that is new and different. [There is] a very strong sense for looking for the next new thing.  
**Designer / Packaging Organisation**

The speed of the market dynamics is a major influence: everything goes faster, and people are thinking: ‘what’s the next thing?’  
**Packaging Technologist / Brand Owner**

The second aspect of The next thing concept relates to issues of temporality, particularly concerned with long-term issues in conflict with the pursuit of short-term goals. Innovation is largely disregarded as a new way of resolving the problem of distributing food, a process in which the drivers would be based on the long-term existence of the product:

Dominated by a small number of retailers: far too much control- they drive what happens in market: either driven by consumer expectations or what retailers think they want.  
**Packaging Technologist / Brand Owner**

Recent drivers are the increasing developments for moving to biodegradable plastics. However, there is no [collection] system for it; no kerbside collection. At the moment there’s no closed loop or composting, but that’s something that we are looking at. We have to be careful about false economy and actually compare solutions with an LCA.  
**Designer / Packaging Organisation**

Nowadays everything goes faster; the dynamics of the FMGC are going faster. We also have to think how to offer products to address the social changes like single person households or smaller households.  
**Brand Consultant / Brand Consultancy**

Changes in lifestyles, so we have to look into changing our offer. Looking at ‘on the go’ or ‘convenience’ range. Also, we are moving to smaller pack sizes.  
**Marketing Manager / Packaging Organisation**
As mentioned before, within the next thing proposition were instances in which awareness on sustainability issues was mentioned as an influence for the configuration of packaging. Yet, in these instances, moving towards sustainability issues was seen as something still yet to come. For example:

*Sustainability is a big influence, particularly around packaging sustainability right now there’s a real focus on [...] less is more, the less packaging that we can put around our product, the better. Now, that’s...I mean part of our role is an education role too, because even though the brand owners now realise that packaging or believe packaging is going to play a bigger role in their brands’ longevity, they are not necessarily packaging experts. They are experts about the brand and we are the packaging experts, so we are really trying to help them joining the dots there.*

*Marketing Manager / Packaging Organisation*

I’d like to say sustainability awareness is a driver, but I don’t think there is any strong driver to improve packaging from the environmental perspective in this country. I think the sort of drivers that should be in place are those which relate to much stronger clarity around the environmental impacts of packaging that are very clearly elaborated and stakeholders understand what the ecological impacts are, not just the perceptions of what these impacts are. With time, sustainability will become a strong driver [...]”

*Packaging Technologist / Brand Owner*

Aspects considered by interviewees as drivers for innovation had a wide scope. They ranged from reducing cost; to speed market dynamics (retailers) and supply chain issues; to pursuing economic advantages; to consumers looking for ‘novelty’ in products; to complying with regulations; and finally to consumers’ awareness of environmental and sustainability issues. Yet it was clear from interviewees’ responses that only if these issues were economically viable would they be a driving force for innovation. A trading scheme in which products are merchandised influences this vision, meaning that an innovation is driven mainly by marketing and short-term goals. According to interviewees, one of the reasons for this is simple: to sell more. In the food and beverage packaging industry, innovation seems to the ultimate resource for its existence, almost for survival.
6.4.2 More, not better

More, not better emerges as a concept that encompasses the consideration of two elements: social concerns and external pressures as drivers for innovation and near-future trends in packaging. Among the social concerns that influence innovation are social trends, lifestyles, demographic changes, access to information, labelling issues, health issues and nutrition issues. External pressures are related to those influences that compel from outside an organisation over which they normally have no or minimal control. For example, there was an interviewee talking about how consumer perception could actually result in moving backwards in terms of packaging sustainability. This is done regardless of the organisation knowing the impact of such action:

A major driver is the consumer perception. For example, the case of traditional quality packaging, i.e., glass bottle vs. new material alternatives, i.e. plastic container. We are now moving back to use glass.

Marketing Manager / Packaging Organisation

Along the same lines, other interviewees pointed out how legislation is sometimes, while inadvertently, pushing towards something less beneficial,

Another trend is [using] smaller containers and downsizing. The problem with this is that we have smaller containers but more containers, and it’s not only a problem for the number of containers, it’s also looking at how does it look carbon-wise? People don’t understand, they think I’ll go for the smaller one of those and that will be better… well, no!

Packaging Technologist / Brand Owner

While packaging goes smaller, people will still consume the same amount of product and then the consumers think they are consuming less, but then they buy 2 bottles of milk or juice. Governments are writing policies that encourage that type of solutions,

Packaging Technologist / Brand Owner

Among the external forces regarded as drivers for innovation, is also the use of technology as a means to improve productivity, and market competitiveness. Hence, to retain control and advance in a competitive market, it is crucially important for organisations to keep
themselves up-to-date according to technological advancements, which are taking place at a very fast rate but again, not necessarily for the better. For example,

We have different manufacturing platforms than in other countries and things can be done here but they can be expensive too. Then, things could be easily imported, there are commercial ways to go around with costs, but we have to go with what Australia is good for: fresh products. If you take that product segment, then you have to enter the export market too. We also have to keep up with technology for being competitive. Issues like shelf life, transport, cost-downs can also drive innovation.

Marketeer / Packaging Organisation

Another external force is the emerging global economy that has drastically changed business practices. This influences how organisations address issues of quality, competitive prices, and consumers’ concerns and so on. One interviewee went straight to the point, suggesting the real driver for packaging innovation:

Maximum sales over the most profitable lines; supply chain efficiencies. This means that there is also a lot of stakeholders to coordinate. That is an existing obstacle.

Packaging Technologist / Packaging Organisation

An interviewee made the difference between the drivers among the different markets:

In Europe, the food packaging industry is driven by consumer design; the market is really competitive and the packaging has high quality. In the USA, the food packaging industry is driven by technology because their aim is to produce more volume [of packages]. In Asia, the driver is technology to reduce costs and be competitive globally. Whereas in Australia, the [food and beverage packaging] industry is driven by consumer demand, while we have to remain competitive through the use of technology and cost-efficiency.

Brand Consultant / Brand Consultancy

Few interviewees referred to innovation as being driven by issues related to the environment; however, some uncertainty was evident when considering the approach to take:
Even though everybody’s looking at biodegradables, you have to be careful with false economy: what is better: biodegradable or recycling?

Packaging Technologist / Brand Owner

Surely, [a driver] is awareness of environmental issues, but people are not ready to pay yet. You might find a lot of studies saying that the consumer is willing to pay; the reality is that they are not. Studies say yes but reality is no.

Design Consultant / Design Consultancy

The trends in packaging are clearly in the direction of providing some sort of functional benefit to packaging: ways of making packaging enhance the consumer experience of the product.

Designer / Packaging Organisation

Legislation was also a recurrent theme that can be associated with the More, not better concept. Some interviewees pointed to the fact that legislation has more influence in the configuration of packaging, in occasions, not for the better:

At the moment, the environment is not a driver; but in 5 years, definitely. The introduction of carbon trading will have an impact. The danger is that there will be always ways to go around it and probably we will do worse than now.

Environmental Manager / Retailer

Legislation, absolutely. In Europe, packaging legislation has changed the kind of materials used, the volume of the packaging, the size of the packaging, because the industry has to pay according to volume size and what type of material. However, the ordinance has put forward the message that industry can produce as much packaging as they want as long as they can or are willing to pay for its collection. While cost is a constraint for companies and certainly they are after cost-reductions, they will go for an option that is more competitive even if it costs more to manage. The cost then will be extended to the consumer.

Designer / Design Consultancy

Legislation, but legislation that is focusing on recycling is giving the wrong message to the industry, so as long as you pay a fee for your packaging to be recycled, you can get away with it, but there are other issues: water usage, energy usage, etc.

Designer / Brand Owner
The concept More, not better puts emphasis to an approach which pursues a type of innovation that improves or better validates a product proposition. The irony, then, is that, from a business perspective, innovation has been commonly linked with technological advancements and not with new ways of doing things for a better result.

The relevance of considering the perceptions on issues of the role of packaging and issues of its configuration relies on the fact that they also have a correlation on the actualisation of packaging sustainability.

6.5 Constant change in packaging

This chapter discussed issues related to the current role of packaging and issues of its configuration as perceived by interviewees. The main concern for the interviewees was to validate the existence of packaging through two elements: Complexity and Invariability.

The complexity of the role of packaging was defined in terms of the diversity of tasks that it is to perform but also in terms of the sophisticated distribution and trading system of contemporary food systems which currently predominate. One issue to overcome is the invariable nature of such distribution and trading system which paradoxically is the reason for the existence of packaging in its present form.

In terms of the configuration of packaging interviewees perceived that its physical configuration is determined by changing external influences. However, the conceptual foundation of packaging rarely changes. That is, packaging undergoes constant changes in its physical configuration but in its essence it persists. The only constant is precisely the changes in its configuration as opposed to its conceptual foundation. That led to two propositions, The next thing and More, not better. The former portrays issues of ephemerality and constant change whereas the latter reinforces the concept that more changes does not signify the better outcome.
Chapter [7]
Packaging: sustaining the unsustainable?

In discussing issues of packaging sustainability, it is indispensable to consider what might be thought of as important elements of the foundations of the very idea of packaging by those creating it. This chapter presents a discussion on interviewees’ perceptions on two issues commonly perceived as conflicting: packaging success and packaging sustainability. This discussion gives answer to research question [B2] (see Figure 4.6):

How do perceptions of packaging success relate to notions of packaging sustainability?

Data relating to two questions from the interview schedule related to perceptions on packaging sustainability and issues of packaging success (interview questions 6 and 7, respectively, appendix A) are reviewed here. To facilitate the discussion, first, interviewees’ notions of packaging sustainability are discussed; in order to later on, contrast them with perceptions of packaging success.

Section 7.1 reviews interviewees’ notions on issues of packaging sustainability. It includes a figure illustrating selected edited extracts from interview data.

Section 7.2 presents the six recurrent themes generated around interviewees’ understandings and assumptions about packaging sustainability with a view to presenting three concepts. A diagram depicts the coding process for each concept. This is followed by the discussion of each concept, supported using interviewees’ quotes.

Section 7.3 reviews interviewees’ perceptions on the elements that are regarded as contributing to packaging success. The pertaining primary interview data is presented in a diagram, followed by a description of its content.

Section 7.4 presents two recurrent themes that emerged from interviewees’ perception on packaging success. A diagram depicts the coding process for the one concept generated, and it is supported using interviewees’ quotes.

Section 7.5 summarises the discussion by pointing out consistencies and inconsistencies in notions of packaging sustainability. This correlation gives answer to research question [B1] in Chapter [9].
7.1 The prospects for sustaining packaging

Acknowledging the notions that those involved in the design process have about packaging sustainability is fundamental to this investigation. Interviewees discussed the question of their perceptions on packaging sustainability or sustainable packaging (interview question 7, appendix A) from their own and different professional perspectives. The results of those conversations are presented in this section, along with an analysis of the results, for which core concepts representing the main concerns of interviewees have been developed. To remain faithful to the research methods, concepts were not created, but the concerns of interviewees on packaging sustainability were reviewed and the concepts emerged, thus avoiding the influence of preconceived issues in their formulation.

The discussion undertaken here does not attempt to establish a definition of packaging sustainability; neither does it assess whether or not such views are ‘appropriately’ outlined, nor gauge the level of awareness of interviewees on the issue. The purpose is, instead, to recognise the major concerns of interviewees when they characterise packaging sustainability and the reasons for these concerns. As such, it is crucial to be conscious that concerns are social constructs, created by each interviewee’s context in the packaging process, rather than ‘absolutes’. From this recognition, it is possible to determine how such concerns translate into decisions and how they may or may not influence design decisions in regards to packaging success. These two sets of data are related to research question [B2] as illustrated in Figure 7.1.

To facilitate the discussion, first, interviewees’ notions of packaging sustainability are discussed; following this, they are contrasted with perceptions of packaging success.
In general, among interviewees there was a clear concern about the management of ‘visible’ environmental impacts, and in particular, the management of those impacts related to the disposal of used packaging materials. Principally, a focus was placed upon dealing with the consequences of material choices, consequences that were recurrently resolved by interviewees through a range of ‘corrective’ strategies. Such corrective alternatives primarily involved the after-use phase of packaging.

Selected edited extracts from interviewees’ notions of packaging sustainability are presented in Figure 7.2 (p. 189). This selection is exhaustive of themes which were mentioned by interviewees, disregarding recurrence or significance.
Figure 7.2 Summary of condensed responses to responses to interview question 7 on 'perceptions on packaging sustainability or sustainable packaging'
Responses indicated that interviewees who are preoccupied with sustainability strive to realise their objectives by designing packaging with reduced environmental impacts. There are many influences that determine the final configuration of a package, with competing interests and conflicting views about impacts, priorities, allocation and relevance. These influences are exactly what needs to be considered when balancing requirements and weighing up priorities. From this, it seems that a more appropriate vision of the sustainability issue is to understand it as a way of thinking about things, a process in which there might be some guiding principles, but these principles are far from prescriptive. Instead, the different perspectives that influence the final configuration of packaging must be acknowledged in order to understand how they affect its realisation. How might concrete aims for sustainability be established? How might the fact that some perceptions of packaging sustainability are not consistent with the values of packaging’s role be explained? Can sustainability in packaging exist if there is an exclusive reliance on a quantitative financial model?

There were those interviewees who defined packaging sustainability in terms of the physical and technical aspects of packaging materials used; commonly mentioned were light-weighting and recycling as strategies to ‘optimise’ packaging. Others focused on the more preferable types of materials used in packaging, that is, renewable and biodegradable materials. A few others referred to packaging design strategies to articulate their understanding of packaging sustainability mainly in terms of re-using or secondary use of primary packaging.

However, there were those who questioned the extent to which these strategies are effective in the long term, mainly in terms of the number of times that a pack can be re-used, as well as encouraging consumers to engage with such practices. Others focused on the struggle that they face when considering the use of virgin vs. recycling content in the manufacturing of the primary packaging. The struggle seems to be based on the fact that manufacturing barriers, quality issues and cost are constraints preventing the incorporation of recycling content in packs. After this theme was analysed, it was frequently discovered that using virgin materials appeared more efficient in terms of being accepted by consumers.

One interviewee, with a broader approach to the issue of packaging sustainability, suggested that a better understanding of social, environmental and economic issues was required across the industry. To highlight the point, they referred to the fact that a package fulfils its role effectively as ‘sustainable’ since it avoided product waste. To a lesser extent they were also concerned with improving existing packaging systems; that is
there seemed not to be a concern with improving the performance of the product-packaging life cycle and other issues of sustainability. Moreover, even with significant improvements across the various stages of the environmental life-cycle, the trend for smaller packages and single serves might result in an overall growth in market volume; this means that gross negative environmental impacts will continue to increase.

Packaging sustainability must take many different factors into consideration. The focus should not be put on materials as a definitional factor, as material choices might be made in terms of the product to be packaged; in design terms, that is something that should be determined in earlier stages of the design process. Then, it seems that materials should be defined according to how a packaging solution is configured, meaning that it is a definitional issue. A major issue to be considered is that defining the need ‘appropriately’ will play a significant role in the ‘achievement’ of sustainability criteria, and this is something that is done via the design brief. What this means is, it is important to consider whether that which has been decided or designed is actually the most ‘appropriate’ way of fulfilling the real need; this is the role that packaging is meant to perform, and which, paradoxically, does not necessarily have to be fulfilled by the packaging. However, there are different angles from which sustainability can be approached: having a ‘recipe’ to follow might overlook the specific contexts and objectives of a product; this might result in contradictions between the product’s own objectives and those which are ‘prescribed’. Therefore, this ‘recipe’ could, and should, undergo adjustments in each individual case; the difficulty would then be to measure and balance priorities and perspectives.

**7.2 Themes on packaging sustainability**

From discussions around interviewees’ notions on packaging sustainability, six recurrent themes were identified:

a) End-of-life management  
b) Preventing or reducing  
c) Thinking or reflecting  
d) From bad to good  
e) Temporality  
f) Elimination

From these recurrent themes, three concepts were developed and are introduced in the current section through the use of diagrams depicting the coding process. From Figures 7.3, 7.4, and 7.5 below, it can be seen that from the above themes a further abstraction
was made resulting in three propositions that portray interviewees’ main concerns when discussing their notions of packaging sustainability:

1) Cure-prevention struggle (Section 7.2.1, Figure 7.3);
2) Ways of doing vs. thinking about packaging (Section 7.2.2, Figure 7.4); and,
3) The Intangible (Section 7.2.3, Figure 7.5).

Analysis of each proposition is undertaken separately as indicated above, and interviewee quotes are presented as supporting material.

**7.2.1 Cure-prevention struggle**

Some interviewees appeared to be involved in a cure-prevention struggle, that is, in a constant disjunctive between providing a ‘remedy’ to what they perceived as the issue with packaging sustainability, and taking a more ‘preventive’ approach (Figure 7.3). They appeared to be engaged in a struggle of dealing with the consequences of packaging, in which materials seemed to be defined as the main issue. While this pattern was not explicit in interviewees’ responses, there was a clear tendency to predefine the issue of packaging sustainability as a problem of material choices and their consequences.
Secondary use. However, we generate so many bottles, that I don’t see all of them being used in a secondary use.

For example, this bottle contains recycled content but it is difficult to blow-mould it [...] so we went back to virgin material because our supplier insisted on it [...] 

There’s a lot of work done in recovering our waste, an environmental benefit that is being driven from a cost point of view – the more waste you produce, that’s actually costing you money.

Not just the design of the package; it’s everything, because our processes are generating waste and greenhouse gases. We need to be careful with what we do.

Every packaging developer should be aware of sustainability issues of their products and be able to distinguish between choices: recyclability, degradability, etc.

It works and minimises the product lost. In perishable products, longing the life of the product.

At least it has to be collected and recycled.

Figure 7.3 Coding process for Cure-prevention struggle from interview question 7 on ‘perceptions on packaging sustainability’
As Figure 7.3 depicts, interviewees were inclined to consider a resolution to this concern as a ‘correction’ of the environmental impacts of materials, mainly through a variety of approaches related to what happens to materials at the end of their useful life. For example:

I believe that we must have a [material] that has the ability to be sustainable over time. It basically negates petroleum-based materials. It’d be based on materials that are either waste to a current process, like sugar cane waste is starting now to become popular, or manufacturing packaging materials or timber waste, so it’s not based on mining and minerals or...yeah, it’s not based on mining and minerals. So I see, long-term packaging as being based on materials that can be regenerated again and preferably from waste from current materials.

**Brand Consultant / Brand Consultancy**

We have to think about packaging sustainability as being a good fit in terms of its selection; where does it come from? Where are the impacts in terms of its materials and in terms of its final usage?

**Packaging Technologist / Brand Owner**

It has to be more than using recyclable materials. People talk about recycling, but everything is recyclable, it just matters at what cost you want to do it. Batteries and mobile phones are recyclable; they are all possible, but is it real? I mean I don’t know.

**Marketeer / Packaging Organisation**

Accordingly, from this point of view, packaging sustainability is perceived to be a goal achieved through the use of those corrective strategies which are believed to ‘overcome’ the environmental issues and impacts of materials.

There were instances where interviewees realised that there were consequences to face in failing to act to avoid the negative consequences of packaging. Further, some talked about how they attempted to anticipate what those consequences might be. The consequences of material choices and manufacturing issues of packaging were a main concern of interviewees. Here, the focus was put on the different stages of the life cycle of a package, which are interconnected and environmental consequences can take place at any time during the process.
A main criticism related to dealing with consequences was the frequency with which consumers are misled by labels and symbols on packaging. For example, the consumer can be led into thinking that a packaging that has a green dot symbol is ‘sustainable’ or even recyclable:

It’s confusing, for example, the green dot system [...] People look at that and they think that it’s sustainable packaging or recyclable packaging and in reality it means nothing. It only means that the companies pay a fee for their packaging to be collected. The [green dot] symbol is green and looks like [the] recycling [one] so in the consumer’s mind it says that it’s a good thing, but it’s misleading.

**Sustainable Designer / Academic Institution**

As this interviewee remarked, the green dot on a package is not more than a symbol indicating that an organisation has paid for collecting and sorting the package concerned, yet this information is not communicated to the consumer. The selection of information to be conveyed through packaging is thus highly problematic and calls the actual sustainability of a package into question.

In the instances in which packaging sustainability was seen to be achieved through corrective approaches, there was an implicit establishment of objectives which offers a range of alternatives for packaging sustainability:

There are choices to minimise impacts, such as the waste minimisation hierarchy; elimination, reuse, recycling, lower litterability of materials and so on. Also, look at renewable sources.

**Packaging Technologist / Brand Owner**

Other interviewees went beyond end-of-life management strategies and materials:

At least, it has to be collected and recycled. I guess it varies from industry to industry but also, it might be using less [materials] to make a particular container; using less energy; reducing cost as well as being collected, and the material can be put back in the process.

**Packaging Technologist / Brand Owner**

An important argument that this point makes is in recognising the ephemerality of the ‘useful’ life of packaging. It is necessary to implement a process that involves
[...] reusing it [packaging material] or recycling it. Packaging normally has a short lifetime; yet, it could be useful for another purpose or composted so it can be returned to the natural cycle; or it can be burned or disposed of in a way that is not toxic.

Sustainable Design Consultant / Consultancy

From a packaging technologist perspective, I would look at light-weighting rather than materials because the materials normally are preset by functionality requirements for the product.

Packaging Technologist / Brand Owner

The content of interviewees’ responses ranged from referring to environmental impacts to more comprehensive perceptions, and within this range, points of concurrence as well as others of inconsistency were exposed.

However, the responses largely remained at a general level, one which tended to emphasise more environmentally ‘conscious’ choices in the media, or the importance that general guidelines be made available. It is important to recognise the reasons for such a basic level of understanding among stakeholders and companies. It is also important to understand what elements, tools and resources (if any) are taken into account or used by stakeholders in order to ‘resolve’ the sustainability aspect of packaging.

7.2.2 Ways of doing vs. thinking about packaging

The concept of Ways of doing vs. thinking about packaging (Figure 7.4) is twofold, and will be discussed in the following section.

The first aspect of the doing vs. thinking concept was generated from the interview data wherein interviewees’ responses were more focused on dealing with the environmental impacts of materials after their useful life and how the way of doing packaging could be improved. There was some confusion expressed by interviewees around how to define packaging sustainability, related mainly to the fact that the approaches to defining it are essentially value judgements, meaning that they are regarded as good or bad, right or wrong. As value judgements are subjective, they are open to interpretation and can mean different things when regarded from different perspectives.
Figure 7.4 Coding process for ways of doing vs. thinking about packaging from interview question 7 on 'perceptions on packaging sustainability'.
For instance, one interviewee demonstrated a clear marketing influence in their approach to sustainable packaging:

I’d say that sustainable packaging is no packaging, but that is impossible, so at least if it reduces materials it’s good... If you have to use a plastic, choose the best so you have the best quality and then you are actually aiding the recycling of it, but you also make sure that it sells the product. It is also packaging that is more efficient and saves time for the consumer.

Marketer / Branding Consultancy

Hence, the meaning of ‘good’ relates precisely to the aspects regarded as important from a marketing perspective: the possibility of avoiding packaging altogether is essentially not considered, something which might have its foundation in the fact that packaging can be, and indeed is, used as a marketing tool. Then, the characterisation of packaging sustainability is made in terms of the materials used, but also factors such as selling the product, and ‘improved’ functionality or appearance which are consumer-related issues. What is interesting here is that certain criteria are proposed in an attempt to define what is good, even if such criteria are determined by specific marketing principles.

Implicit in the above response is that using the value judgement of ‘good or bad?’ as a gauge when considering solutions or initiatives in the sustainability of packaging might not be the appropriate criteria. That is, limited criteria might disregard more comprehensive information that could help to make a more accurate appraisal and thus a more sustainable outcome. An apparent risk in seeing things from this perspective is that it might be based on one specific approach – in this case recycling – as ‘absolute’ criteria for determining packaging’s attributes in relation to sustainability. In this case, packaging sustainability is regarded in terms only of the end-of-life management of materials and their environmental impact after being used. If a decision in the design process is made based solely on one factor, such a decision might lead to deceptive or biased outcomes in relation to packaging sustainability, as other factors which have to come into consideration, and which might change the choices made, are discarded.

One interviewee described the other factors that come into consideration in the decision-making process, all of which relate to material selection:

In some cases, it might mean using recycled materials; in other cases, it might mean using virgin materials. In some other cases, it might mean using biodegradable materials; in other cases, it won’t. And that will be a
constantly moving target as materials develop, as recycling systems and infrastructure develops and changes […] 

Packaging Technologist / Brand Owner

Other examples of this approach were depicted as follows:

[Packaging which] incorporates recycled material (PCR) when it doesn’t create manufacturing issues. Sometimes it’s better using virgin materials. There are quality issues for export.

Packaging Technologist / Brand Owner

From a packaging technologist perspective I would look at light-weighting rather than materials because the materials normally are preset by functionality requirements for the product.

Packaging Technologist / Packaging Organisation

For example, the plastic bag issue. Banning is not the solution, it is important to take into account how people use them. People reuse them; they use them as rubbish bags, to put something in the fridge. Looking at the real issue; human beings are the issue, how can we limit the amount of waste?

Packaging Consultant / Packaging Consultancy

The second element of doing vs. thinking comprises instances in which sustainability is understood as the conceptual reasons behind packaging considerations, as well as the way these reasons influence the decisions of those involved in the packaging process. For example:

The first question: Is it possible to eliminate the normal way of packaging this product and replace it with something that is further up the chain in terms of the dispensing of what’s being packaged?.

Design Consultant / Design Consultancy

As a designer involved in sustainability, you don’t think about sustainable packaging per se, you first ask, what’s this product about? Is it necessary? Is it sustainable? Then if not, why bother about its packaging?

Sustainable Designer / Design Consultancy
On the other hand, in a few instances, interviewees’ attempts to define packaging sustainability provided certain criteria to be considered in terms of the design of packaging, mainly focused on issues related to material selection and end-of-life management options. At times they also included manufacturing process issues, but those definitions did not in reality, at least for the most part, define it in terms of design. These attempts passed over many issues that design is concerned with, and they considered aspects which cover the materials used as actually defining design.

In a general sense, interviewees here saw sustainability as a way of doing things in which a course of action can be prescribed, crucially disregarding the thinking process that has to occur before posing the question of the requirements of packaging. First, if the result of the activity of design, i.e. the ‘designed’, is what is considered important; the focus then tends to be on how to do things. If packaging sustainability is looked at in terms of the decision-making procedure, rather than the process as such, then the important thing is how decisions are made and why. That is, design thinking.

In addition, it would not be appropriate to look at packaging sustainability from only one aspect in isolation, in a similar way to that discussed above. More importantly, when such a vision of packaging sustainability is disconnected from the role of packaging and is considered as a parameter for packaging sustainability, it becomes important to assess if the functions that a package is meant to fulfil are appropriately fulfilled as a reference for sustainability. A critical issue that needs to be acknowledged is thus that packaging sustainability cannot be discussed without considering the product that is being packaged. This product-packaging relationship will determine the parameters for sustainability. One interviewee described this relationship:

You can’t have sustainable packaging independent of what’s being packaged. So I see sustainable packaging as being integrated with a sustainable product; what you end up with is a form of packaging that is sustaining something. If that is not the case, what you end up with is a form of packaging that is sustaining something which is unsustainable; therefore the key thing for me is the relation between the packaging and the packaged.

Sustainable Design Consultant / Design Consultancy
Although, this view still has material choice as its focus, it is relevant to note that sustainability is here regarded as variable and relative, as opposed to fixed and absolute, and thus other aspects might influence the decision-making process. From this, an understanding of packaging sustainability takes on a different hue: from an approach that is fixed, and either ‘good or bad’, it can be seen as a situation that might be dealt with in different ways specific to each case.

The main issue considered when collating the data for the concept ‘from bad to good’ is that each participant took a position on packaging sustainability, either considering it as relying on an ‘absolute condition’, or on a condition whose definition is still on the way to being ‘deciphered’; or, alternatively, denying the existence of the condition, an approach which broadened the characterisation of packaging sustainability in the minds of interviewees.

### 7.2.3 The Intangible

Packaging sustainability and the reference to temporality is an interesting concept that emerged throughout the analysis of interview data. It is crucially important to consider time when considering sustainability, two concepts which are intrinsically related. There were some sceptical positions which argued the suitability of the term’s definitional function, due to the ambiguous-complex duality of the issues that surround it. While there was recognition of the existence of certain preferable factors and qualities in relation to sustainability, these factors and qualities were regarded as relative, in a state of constant change and often unpredictable. Another struggle that interviewees faced in defining sustainability was the almost ‘idealistic’, absolute and fixed connotation that the term carries and which, in turn, is perceived as ‘intangible’ or unattainable. The concept The Intangible was generated out of interviewees’ responses that illustrate the way these concerns were articulated [Figure 7.5].
Figure 7.5 Coding process for The Intangible from interview question 7 on ‘perceptions on packaging sustainability’
The following are some examples of interviewees’ perspectives on packaging sustainability under the concept of The Intangible:

I don’t think it exists. There is not such a thing, but there are choices to minimise impacts.

**Packaging Technologist / Brand Owner**

[…] as ‘sustainable’ as possible, that is different; but ‘sustainable’ package… I’m not sure.

**Packaging Technologist / Brand Owner**

It’s very tricky, very hard.

**Marketer / Packaging Company**

A characterisation of packaging sustainability in terms of temporality, which is also intangible, is as follows:

It’d have to be something that we could still be making in 20 years’ time or 30 years’ time or 50 years’ time. As in, whatever and however we are doing it, it is sustainable; it is something that we could still do a long way into the future. If into the future, we ran out of oil, which we will […] then if you are talking about something that is made from plastic and there’s no other way of making it possibly in 50 or 100 years’ time […] is it sustainable? No, it’s not, clearly!

**Packaging Technologist / Brand Owner**

Sustainability in terms of time and business survival is a reflection that emerged from what interviewees largely implicitly say. They assume that the trading and distribution system will remain the same, that it is unchangeable. Packaging sustainability needs to be discussed in the context in which its very existence has in fact been regarded as ‘necessary’, namely in specific merchandising systems such as supermarkets and smaller grocery shops. The relevance of acknowledging such a context is that the existence of packaging is subordinated to it. In different trade and merchandising systems such as local markets, the concept of packaging takes another dimension as it would not necessary be used as marketing tool but as a container of a product.
In some instances, positive impacts from packaging were perceived by interviewees. Some of its functional roles were considered as factors in packaging sustainability. That is, the use of packaging could result in the contents lasting longer:

[...] packaging actually plays a role in extending the life of it [the contents]. So from that aspect you start to say: well, hang on, all of a sudden packaging has gone from being the bad guy to actually being the good guy.

Marketer / Packaging Company

Other interviewees deliberately admitted not ‘knowing’ how to define sustainable packaging; nevertheless, they were implicitly trying to overcome their uncertainty by proposing alternative approaches that could assist them in controlling such ambiguity:

I don’t know how to answer that.

Packaging Technologist / Brand Owner

We have a working party right now trying to figure out what ‘sustainable’ packaging is really all about.

Marketer / Packaging Company

It is almost not the right grammar, it does not make sense; it’s not the packaging that is ‘sustainable’. To me ‘sustainable’ packaging is a packaging that has a positive impact on the environment and minimises its carbon footprint [...] 

Branding Consultant / Brand Consultancy

It is noteworthy that interviewees questioned both the correctness of the term and their own knowledge, which led them to form a more informed and ‘conscious’ opinion about packaging sustainability. They suggested that the issue should not be seen in terms of packaging being ‘sustainable’ or not, since sustainability is not a built-in characteristic of packaging. Instead, they proposed approaching it by considering the feasibility of packaging bringing about ‘benign’ impacts to the environment. A particular observation from this assertion is the common understanding among interviewees that packaging sustainability can be achieved only under the condition that ‘negative’ impacts on the environment are avoided or reduced. However, when the environment remains the main consideration, there are inherent questions that need to be asked: which aspects of
packaging in a broader sense might be regarded as ‘sustainable’, and how can they be ranked against each other?

Interviewees with more sophisticated arguments distinguished some external conditions as conflicting with the realisation of packaging sustainability. At the same time, hesitation was expressed around the likelihood of its actualisation:

*There is not such a thing, or it’d have to be a very radical thing: something like an apple that grows inside the packaging and it also can be sitting in the supermarket without any wrapping.*

Packaging Technologist / Brand Owner

It seems that a major difficulty is confronted here in the attempt to match a black-and-white approach on sustainability with the specific circumstances of the contexts in which packaging is required, namely the retail context. Despite its extreme position, the significance of this view is its recognition of the existential relationship between packaging and the retail context, in which it seems that the retail requirements constitute an obstacle to actualising packaging sustainability. In other words, it appears that within the industry itself, packaging sustainability is actually regarded as undefinable due to the trading specifications that exist within the retail context.

### 7.3 The artificiality of packaging and its success

The concept or idea of packaging is one that has been artificially created by both a society and an industry that perceives and uses packaging to serve their purposes. Interpretations of what might constitute successful packaging (interview question 6, appendix A) allows for an identification of which elements of packaging are actually regarded as important.

A summary of condensed responses to interviewees’ perceptions on packaging success is presented in Figure 7.6. This selection is exhaustive of themes which were mentioned by interviewees, disregarding recurrence or significance.
Figure 7.6 Summary of condensed responses to responses to interview question 6 on perceptions of 'successful packaging'
Packaging success is a complex and rigid, yet, subjective concept to define. To interviewees, packaging seems as readily intelligible as its purposes themselves: the need for packaging is simply taken for granted. Packaging success engages with issues that have an effect on the actual decisions made in relation to packaging. That is, it looks at how interviewees have shaped the parameters of what might be considered successful packaging. On the one hand, answers to this question were delineated in terms of the extent to which a certain criteria was actually fulfilled by packages; such criteria seemed to be connected to the level of importance given by interviewees to different roles of packaging. On the other hand, packaging success was understood in terms of the ideal conditions in both, the industry and design practices, required to better balance up the various roles of packaging; particularly, in terms of how it would be possible to define packaging success in terms of issues of sustainability.

In those instances in which packaging success was interpreted based on the level of importance of packaging elements, it was generally implied that at a minimum, packages need to perform basic functions, that is, protect and contain the product throughout the stages of the supply chain; an explicitly expressed major concern was, however, that such functions need to be accomplished in the most cost-effective way. In contrast, an element unambiguously associated with success was the degree to which a package assists in the commercialisation and retailing of a product. That is, successful packaging was related to the accomplishment of marketing objectives. Then, the most important elements of packaging success, according to interviewees', seemed to be based on having the ‘right’ appearance to appeal to consumers and/or adding value through convenience or through functionality features. There was an inherent assumption by interviewees that such elements are indispensable means for achieving a vast range of marketing-related goals including: presenting the personality of the product; supporting the product’s brand; standing out on the supermarket shelf within the limited shelf space available; facilitating the merchandising of products; attracting consumers’ attention through differentiation; offering consumers’ benefits; creating an emotional attachment with the product, and, therefore, encouraging and increasing product sales.

Another aspect of packaging success brought to the conversation was based on the technical complexities of packaging materials and the degree to which they can be resolved. This concern was often expressed in terms of the difficulties faced in trying to deal with issues of materials’ structural performance, palletisation, manufacturability, recyclability and the issues arising from using new materials, while at the same time meeting marketing requirements. Among the elements of packaging deemed as important in this instance was: being able to be manufactured in specific manufacturing
plants. That is, it seemed that packaging success was defined in terms of resolving technical complexities subordinated to commercial objectives and defined by the trading system in which packaging exists.

7.4 Consensus and contradictions between packaging sustainability and packaging success

Despite the general sense of uncertainty that interviewees demonstrated in terms of the future of sustainability in packaging, the majority provided an interpretation or view of packaging sustainability. In some instances, a characterisation of packaging sustainability was achieved by exclusion; that is, by refusing to compromise on a specific description of it. Some interviewees were able to elucidate critical aspects for consideration. While among interviewees’ opinions, there was not a collective voice, there was a noteworthy emphasis put on associating packaging sustainability with the technical aspects of packaging, or material-related issues. In many instances, the concern was, specifically, to deal with the negative environmental impacts associated with packaging materials after they have fulfilled their ‘useful’ function, and as such a considerable part of the discussions focused on this issue, with a few exceptions.

From the analysis of the set of data presented in this chapter, answers research question [B2] What transitions are required to move towards packaging sustainability? Lost in translation and Option or necessity? are discussed in Chapter [9].
Chapter [8]

Sustainability: Option or Necessity?

Based on the existing literature, features of the organisational structure of the packaging industry, as well as drivers and obstacles to packaging sustainability were reviewed in Chapter 3. The current chapter gives greater consideration to the many intricacies of business practices of the AF&BPI which, according to interview data, influence organisations’ approaches to packaging sustainability. From this analysis is then possible to answer research questions [C] and [D], respectively:

How is the structure of the AF&BPI influencing the setting and realisation of packaging sustainability?; and

What transitions are required to move towards packaging sustainability?

To facilitate its reading, the four sets of data from the interview schedule relating to these research questions are reviewed in two main sections, which correlate to the two above research questions.

Section 8.1 presents the two sets of data related to research question [C]. First, interviewees’ perceptions regarding drivers to encourage organisations to engage in packaging sustainability (interview question 8, appendix A) are described. Next, interviewees’ rankings of environmental decisions (interview question 9, appendix A) are explained. Following this, the initial coding process of each set of data is presented separately, clearly elucidating their recurrent themes; the final coding of these two sets of data is then performed concurrently. Finally, the three main concepts generated from these data are discussed and illustrated with interviewees’ quotes.

Section 8.2 presents the two subsequent sets of data related to research question [D]. Data on tools/information used or required by interviewees in order to make more informed decisions regarding issues of packaging sustainability (interview question 10, appendix A) are presented. Then, interviewees’ perceptions on challenges faced by the AF&BPI towards packaging sustainability (interview question 11, appendix A) are discussed. Again, the initial coding process of each set of data is undertaken separately, clearly elucidating their recurrent themes; then, the final coding of these two sets of data is again performed concurrently. The three main concepts generated from these data are discussed and illustrated with interviewees’ quotes.

Section 8.3 provides a summary of the concepts presented in this chapter, in the form of a proposition formulated to answer research questions [C] and [D], to be discussed in detail in Chapter [9].
8.1 Intricacies of the organisational context of the AF&BPI

Reviewing interviewees’ perceptions on drivers to engage organisations in packaging sustainability (interview question 8, appendix A) and interviewees’ ranking of environmental decisions (interview question 9, appendix A) is simultaneously in the current section. Asking interviewees these questions allowed the identification of perceived trade-offs, bargaining processes, opportunities and obstacles for the AF&BPI towards packaging sustainability. In doing this, it is then possible to elaborate propositions to answer research question [C] regarding how the structure of the AF&BPI influences the setting and realisation of packaging sustainability. Figure 8.1 illustrates the relationship between these two sets of data and research question [C].

Figure 8.1 Relationship between interview questions 8 and 9 and research question [C]

8.1.1 Drivers for engaging organisations in packaging sustainability

This section analyses data regarding interviewees’ perceptions on drivers to engage organisations in packaging sustainability (interview question 8, appendix A). When interviewees were asked this question, it was anticipated that their answers would provide insights in their decision-making processes and reasons for their current approaches to issues of packaging sustainability.

Figure 8.2 presents a summary of condensed responses to interview data on interviewees’ perceptions on how to engage the industry in packaging sustainability.
In general, interviewees acknowledged that organisations needed to consider issues of packaging sustainability. The major reasons pointed out by interviewees as to the...
insufficient industry engagement with issues of sustainability, however, were principally related to economic constraints and conflicts with marketing objectives. Others recognised that one driver to engage the industry in issues of packaging sustainability could be related to competitive advantage. However, it seemed that organisations were still in the early stages of understanding the benefit of packaging sustainability, and as a result of this, of choosing appropriate approaches. Some other interviewees mentioned that a perhaps more major driver to engage in issues of sustainability was associated with internal organisational motivation. One example of this was, if organisations already had a mission statement or business purpose specifying an environmental or sustainability objective. Interviewees acknowledged, however, that more could be done across their organisations, and particularly in marketing departments, to adopt a more significant approach to sustainability. Corporate social responsibility was also mentioned extensively as an internal driver for organisations. There was an explicit recognition that business survival in the long term was directly associated with taking responsibility in the present for their activities. However, corporate social responsibility appeared as insufficiently understood or integrated into business practices. That is, it seemed that actions taken under this self-regulatory mechanism were still perceived as in conflict with economic business objectives. The result of this was that actions performed in the name of corporate social responsibility were undertaken because of compliance rather than out of a real conviction that organisations had any responsibility to society or the environment. There were a number other instances in which a higher level of internal motivation was expressed in terms of compliance with regulation. For example, becoming signatories of the former NPC (now APC) was mentioned as an increasing driver, particularly since organisations have to both report their performance against Covenant KPIs and write up an Action Plan. In these instances, interviewees regarded complying with regulation as an internal driver; however, such a driver implicitly became both an internal driver in terms of doing ‘the right thing’, and an external driver in terms of avoiding punitive actions.

There were also those interviewees who perceived that external factors or influences in general were significant drivers to engage organisations in packaging sustainability. Among the most commonly mentioned factors were external scrutiny from NGOs and pressure from consumers; others referred to the influence of actions taken by overseas retailers and major brand owners; a few others perceived the forthcoming carbon tax as a driver. Related to this external pressure, communication with other stakeholders was another issue brought up by interviewees, principally in terms of sharing information and knowing what other organisations were doing regarding issues of packaging sustainability.

Note that the NPC changed its name to Australian Packaging Covenant early in 2010, after the interviews were conducted.
Interviewees acknowledged that, among external factors, pressure from NGOs and consumers was the biggest driver for organisations’ engagement in packaging sustainability, due frequently to fear of media exposure or a damaged corporate image. Conversely, in the instances in which interviewees talked about organisations’ genuine engagement in issues of packaging sustainability, lack of certainty was referred to as the biggest barrier for full engagement. This need for certainty was defined mainly in terms of the risk to organisations in relation to invested time and economic resources against outcomes. For example, if organisations took on board issues brought up by NGOs and/or consumers regarding packaging sustainability, there was no certainty that this would translate into consumers' understanding or appreciation of the actions taken; consumers’ education and communication were referred to as the major challenges to organisations. This education of consumers was explained in terms of changing their assumptions on issues of packaging sustainability to avoid misunderstanding in their minds of organisations’ actions taken. The struggle for organisations thus seemed to be in terms of whether investing time and money for taking the called-for approach to packaging sustainability was advantageous at all if consumers were not able to recognise the appropriateness of their actions.

Another issue mentioned by interviewees was related to communication with consumers about the advantages of certain actions over less favourable ones. Again, the lack of certainty in terms of effectively communicating these messages emerged as a factor that discouraged organisations from exploring more innovative options regarding packaging materials, packaging formats or actions across their organisations. In these instances, interviewees explicitly portrayed the issue in terms of the marketing objectives with which they are bound to comply. Interviewees stated explicitly that consumers are not ready to pay more for ‘better’ packaging options, regardless of what they say. They implied that if a balance could be reached between costs and marketing objectives, this could be a driver for organisations to engage in packaging sustainability.

Need for certainty was also expressed in terms of having available and reliable information on material impacts and strategies for overcoming those issues. Others expressed that the need for certainty factor goes back to knowing what the real impacts of packaging were. Others still referred to lack of certainty in terms of insufficient leadership from the government and the industry in general in setting a clearer direction for packaging sustainability. Further, some interviewees expressed concerns in terms of when their own internal initiatives are in conflict with regulation objectives. Here, such lack of certainty was expressed more in terms of not knowing or not having the human resources within the
organisation to be able to make the most appropriate decision. Arguments to support this position were made around the social responsibility that design practitioners have in society. Early planning and the implementation of a sustainability agenda as part of the design process were highlighted as important drivers in being more readily engaged in issues of packaging sustainability.

8.1.2 Ranking environmental considerations in packaging design

Interviewees were asked to discuss their decision-making processes for ranking environmental considerations within packaging design (interview question 9, appendix A). This allowed for an understanding of their motivations and reasons behind decisions made as opposed to merely asking whether they integrated environmental considerations in packaging design decisions. Figure 8.3 presents selected edited extracts from interview data on the ranking of the environment in packaging design.
Figure 8.3 Summary of condensed responses to interviewees’ perception on question 9 ‘ ranking of environmental considerations in packaging design’

A general tendency to regard environmental considerations as a high priority in decision-making processes prevailed. Nevertheless, interviewees’ noted that such ranking varied...
according to the type of organisation and/or interviewees’ own level of involvement in packaging design decisions. That is, environmental considerations were regarded as important; yet, they were not fundamental or at the same level of importance for each stage in packaging-related decisions since environmental considerations are made within economic constraints. It was further explained that, for the most part, environment-related decisions are already specified in marketing briefs and they rarely ranked higher than the economic ones. Further, it was noted that when environmental considerations were addressed in briefs, they were often understood in a limited way. Specifically, briefs focused on issues of material selection, recycling strategies or materials with recycled content. Some interviewees made the point that marketing departments often argued against environmental considerations, citing data collected through consumer research as evidence.

Then, the process of ranking environmental considerations was commonly referred to by interviewees as a complex one. Interviewees’ identified as a major difficulty the fact that environmental decisions were established by and subordinated to other factors, predominantly, marketing creating tension with other players involved in packaging design. Other interviewees highlighted that to avoid such tension, a more strategic approach needed to be taken within organisations regarding environmental considerations. That is, formulating an environmental strategy to determine the direction of the organisation and making decisions accordingly. Along similar lines, other interviewees regarded as fundamental that environmental objectives be embedded in organisations’ mission statements, in order to enable a higher rank of environmental considerations in packaging design. According to interviewees, this process would also allow the embedding of principles of sustainability in their design process and other related activities, again making it possible to rank environmental considerations higher.

Other issue associated with the ranking process of environmental considerations was the hierarchical structure within organisations in the packaging industry, and the level of interviewees’ responsibility within larger organisations. Interviewees often found it difficult to bring their insights or understanding of environmental issues into decision making and, while they may themselves have ranked the environment very high, and while they may have come up with alternatives, such decisions were generally detached from their roles and responsibilities.

In other instances, it was acknowledged that even if interviewees’ roles allowed for more influence in decisions related to issues of sustainability, such decisions were also subordinated to other external factors. For example, for packaging manufacturers, the
ranking of environmental considerations depended on the customer; the availability of resources including the time, money and infrastructure needed for more innovative alternatives; the type of product; and ultimately, if the final cost could be passed onto consumers. For example, some interviewees mentioned that environmental considerations in a generic product ranked lower in the process than in branded ones. The rationale behind this was that generic products were cheaper since no resources were utilised to create a brand or image; therefore, increasing their cost was not feasible. In the case of branded or premium products, it made more sense to consider environmental issues related to packaging, since this would often have been consistent with the product.

Those involved in the environmental decisions of packaging within organisations generally recognised they were in a position to rank the environment highly, and look proactively for a change. The degree of such change would range from making changes to individual aspects of packaging materials (for example, the source of raw materials, reusing recycled papers, using local materials, light weighting, reducing weight of transportation, compostability, renewable energy), to larger changes in processes and business practices. Negotiation and agreement were pointed out as major factors in determining the level and type of approach to environmental issues.

Other interviewees responded to this question in a more cautious way, stating that the level to which environmental factors were considered varied from case to case. For packaging design or brand consultancies, the extent to which environmental decisions were considered depended on how far the client wanted or was prepared to go. Those involved in the planning and design of packaging in a more holistic way, pointed to the fact that to avoid such restrictions in the process, environmental considerations should be anticipated and negotiated from the beginning of the design process, to avoid conflict between those involved at later stages. However, an assertion was made that the product to be packaged often had more impact than the actual packaging. Further to this, it was noted that seeing the ‘bigger picture’ was more important than focusing only on the environmental considerations of individual packages.

In other instances, it was noted that the level at which environmental considerations were ranked depended on what the expectations from packaging were. While there could have been a desire with an organisation to take the most environmental packaging option, some interviewees noted that the order of requirements was generally based on the provision of consumer benefits, product differentiation, and cost. Environmental considerations ranked last in that list. Using packaging as a marketing tool was commonly
referred to as the main constraint to consider issues of the environment higher up in the hierarchy.

In general, the consensus was that environmental ones are ideally ranked high in the hierarchy of considerations, but always within cost restrictions. According to interviewees, the level of consideration of environmental issues of packaging was largely defined by type of product to be packaged and organisations’ objectives.

8.1.3 Recurrent themes regarding decisions of packaging sustainability within organisations

Two sets of interview data related to encouraging organisations to commit to issues of packaging sustainability (Section 8.1.1) and rankings of environmental considerations within design processes (Section 8.1.2) (interview questions 7 and 9 respectively, see appendix A) were presented in the previous two sections. The recurrent themes found in these two sets of data and their coding process is presented here in two separate figures: Figure 8.4 and Figure 8.5 to facilitate their understanding.
Figure 8.4 presents the initial coding process, namely the reduction of data and the identification of similar content or recurrent themes (refer to Table 4.3), for interviewees' perceptions regarding encouraging organisations to commit to packaging sustainability. The two recurrent themes found were: external scrutiny and certainty.

[ selected edited extracts from data ]

Certain fear-factor from the greenies; having environmentalists as "outsiders" in the decision making process to point out to what we should be doing.

Packaging companies and manufacturers should be aware of the issues, not just being caught up in "fear-factor".

Reliable information that is more readily available on material options; we don't understand what is the base of materials' types, it would be a valuable tool for a designer to have access to that information.

One of the key things for us would be to incorporate it to our product development strategy; we'd like to write a process up that considers green design in a more structured format.

Industry is very focused on making it recyclable, and they don't seem to understand, what the real issues are. It comes back to a fundamental understanding of sustainability.

Having the right information on new materials and technologies as well as issues about recyclability or LCA's and then encourage companies to make more sustainable decisions.

The equation is: "what do you want to privilege? long-term survival of your business or short term returns?" This is part of an ongoing discussion that the food and grocery council has been pushing. Also supermarkets pushing to consider issues.

Sustainable packaging has to be adopted as the philosophy of the company.

Government needs to enforce it. NGO's and consumer's pressure have a role too.

[ recurrent themes ]

Fear of external scrutiny, outside input: fear-factor from the greenies; not just being caught up in "fear-factor"; governments NGOs and consumers 'pressure.

Need for knowledge or understanding, sense of purpose or certainty: need for reliable information; understanding of sustainability; long-term vs. short-term views; embedded in design process or company philosophy.

Figure 8.4 initial coding process from interview question 8 on 'perceptions regarding encouraging organisations to packaging sustainability'
Figure 8.5 portrays the initial coding process for interviewees’ perceptions regarding the ranking of environmental considerations in the packaging design process. Two recurrent themes were also established: **not essential** and **a big tension**.

**selected edited extracts from data**

- We consider the environment as part of our design process but not as good as we should be doing it.
- The challenge is to deal with the ‘marketing requirements’, the designers can't do much alone; it has to be more a strategic decision: always a big tension between marketing and design.
- Normally [clients] are open to the idea [packaging sustainability], they don't want to go too far.
- We struggle with quantifying environmental impact of packaging, where do you draw the line between cost and environmental impact. It’s difficult to make a straight comparison between options.
- Rarely the environment ranks higher than the cost.
- Not a real driver yet. Cost is normally on top of the environment. It’s off the radar screen of marketers.
- It’s constraint by cost. We’ll choose the best option within that constraint. The environment can’t be the most important consideration.
- The environment should rank high but clearly the products and the growing, the processing and the transport of the product had the most significant environmental impact than the packaging itself.
- It’s important but not a major consideration, I have a business to run and unfortunately, it’s not a priority.
- We have sustainability as part of our list of “wants”, it ranks very high, but that doesn’t necessarily translates high in the whole process as we have a marketing brief to follow and you have to look at cost.
- It will depend on the type of product but if’d have to be cost-effective; if you have two similar options it has to make sense with the type of product.

**[ recurrent themes ]**

- **important but not essential:**
  - optional, should be considered high in the hierarchy; not going to far; difficult to make straight comparisons; not a priority; not necessarily translates in the process.
- **a big tension:**
  - tension between design and marketing; between cost environmental impact; not most important consideration; off the radar screen

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**Figure 8.5 initial coding process from interview question 9 on ‘perceptions regarding the ranking of environmental considerations’**
Then, Figure 8.6 brings together the recurrent themes from each set of data showing the final coding step in which three concepts were generated:

1. Fear-factor (Section 8.1.4);
2. Need for certainty (Section 8.1.5); and
3. Off-the-radar (Section 8.1.6).

![Diagram of themes and concepts]

Figure 8.6 Final coding process for interview question 8 and 9
Once the three recurrent themes were compared between each other, a final proposition is drawn out from these three concepts named: Option, or Necessity? This proposition is discussed in Chapter [9] to give answer to research question [C] regarding how the issues of the structure of the AF&BPI are influencing the setting and realisation of packaging sustainability. The three recurrent themes of this set of data are discussed as follows: Section 8.1.4 Fear-factor, Section 8.1.5 Need for Certainty, and Section 8.1.6 Off-the-radar.

### 8.1.4 Fear-factor

The fear-factor concept refers to the extent to which the influence of external factors play in decision-making processes keeps one from doing something or prevents or allows an action, specially due to fear. That is, interviewees’ concerns were defined in terms of the fear of media exposure which prevents organisations from bad business practices or prevents them from taking actions that could result in a damaged corporate image. Rather than an internal motivation, main reasons for organisations’ engagement in packaging sustainability are external factors that predominantly include public scrutiny, and outside input or pressure from governments NGOs and consumers. A major implication of the fear-factor approach in decision-making processes is that the consideration of environmental issues is perceived as an optional business practice as opposed to being already embedded in organisations’ design processes. In other instances, the fear-factor approach is associated with the survival of the business itself, if considerations of sustainability issues are not taken by organisations. Interviewees’ quotes are presented here to exemplify the fear-factor concept.

For example, there were many instances in which issues pertaining to the fear-factor concept were associated with the pressure that green movement campaigns and initiatives, as well as other NGOs, can put on organisations. One interviewee clearly expressed this belief by referring to The Boomerang Alliance⁶, an Australian environmental group campaigning for recycling on packaging, among other things, and the pressure that it has on industry:

> I think most major companies are aware of environmental issues but it’s a bit hard to take them on. We all know that we should be doing the right thing environmentally speaking, but we still need people like the Boomerang Alliance, the greenies and others...

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⁶ The Boomerang Alliance works with business, government and the community to promote waste avoidance in Australia.
Packaging Technologist / Brand Owner

While there was a recognition that some organisations were already aware of what ‘the right thing to do’ was, it seemed that organisations’ fear of doing the wrong thing translated into taking on a reactive approach rather than a proactive one. Any pro-environment action taken could thus be considered not as the result of a conviction or sense of responsibility for the organisation’s actions; instead, it emerged that until organisations’ practices are put ‘under the spotlight’ and it becomes unavoidable, organisations will not feel compelled to take a more analytical approach that leads to an appropriate course of action in their practices. For example, one interviewee proposed bringing external practitioners into their decision-making processes in an attempt to encourage their organisation to do something about the environment:

> Having a meeting with marketers and environmentalists – have these people as “outsiders” in the decision-making process to point out what should we be doing. Even though sometimes they are an extreme view, we need to contemplate that. We need to understand the extremes, because this could be where we are heading towards. That could be a major driver.

Packaging Technologist / Brand Owner

On the other hand, external pressures were also considered to be misleading in terms of the industry’s understanding of the type of engagement required, in a particular market context, towards packaging sustainability. Moreover, these external pressures could push organisations in the ‘wrong direction’, or promote alternatives without considering the greater context or the bigger picture. Some interviewees expressed their fear as follows:

> Industry is very focused on making it recyclable, and they don’t seem to understand what the real issues are. They tend to think ‘It’s made of paper and paper is recyclable, so it’s okay’. It comes back to having that fundamental understanding of sustainability for the packaging industry.

Design Consultant / Design Consultancy

The Australian government tends to follow the United Kingdom and the Canadians when it comes to setting our own standards. [...] The UK is looking around carbon footprints. Do carbon footprints suit us? Don’t know, we’ll try to understand it. [...] we are literally just watching the entire
stage and talking to people that we think are relevant and well informed and influential in this discussion [...] 

Marketer / Packaging Company

Other instances in which the fear-factor approach was adopted to engage in issues of sustainability were related to an internal aspiration to do ‘the right thing’ based on external influences. Examples of this were actions that promote organisations’ aspirations based on mission statements, or by being bound to a regulation:

Corporate responsibility: it may be that engaging in packaging sustainability will cost but it’s the right thing to do. [A driver is] understanding that changing is an investment in terms of company reputation.

Marketer / Packaging Company

[Having] a mission statement: ours is to help people make sustainable choices. We recognise that we have packaging formats out there at the moment that are not collected at all. We’ve probably come a really long way since we started that [commitment] for sustainability.

Environmental Manager / Packaging Company

[The] NPC is one driver for us. We are working towards benchmarking our practices. We also have many definitions to work on. There’s also a struggle between signatories of the NPC and our own internal initiatives. The definitions are different. The focus for us is upgrading our system and methods to analyse our data more effectively and unify reports.

Packaging Technologist / Brand Owner

The fear-factor concept was also related to instances in which participants believed that regulation was the only driver powerful enough to force organisations to have a more active role in the actualisation of packaging sustainability. Here again, the fear of confronting the consequences of not doing ‘the right thing’ emerged as an effective driver for companies to consider sustainability issues. An increasing range of governmental regulations, initiatives and agreements (voluntary and mandatory) together with environmental policies, regulations and standards associated with packaging end-of-life management have been introduced in many countries to ensure that companies take responsibility for the impacts resulting from their activities. Such is the case in Australia, where sustainability has become a concern in the packaging industry, whether a genuine
concern or as a part of a global trend; nevertheless, some commitments have been made
to encourage businesses to offer more environmentally responsible choices in their
products as well as their packaging. The formerly-named NPC takes an approach that
aims to minimise the environmental impacts, arising from the disposal of used packaging,
by promoting the re-use and recycling of packaging materials. As the NPC operates as a
voluntary agreement between the three levels of government (federal, state and local)
and the packaging industry (brand owners, manufacturers, retailers and fillers), there is an
obligation to sign up to it. Further, the fact that there is pressure on Covenant signatories to
report on their performance against the Covenant’s objectives was pointed out as key
influence:

Packaging companies and manufacturers need to be aware of the issues
and not just being caught up in ‘fear-factor’. Having said that, I believe
that the NPC is a significant pressure for us due to the fact that we have to
report to it every year which is a major commitment

Packaging Technologist / Packaging Company

From the perspective of external pressure, it seems that organisations would genuinely
consider sustainability, as there are risks involved in non-compliance that go from bad
reputation to financial penalties or even the shutting down of companies. Then, it seems
that they are driven more by external influences than by internal ones. A major factor to
be considered is the fact that sustainability in products has commonly been perceived as
having a cost-related implication; everything that is related to cost needs to make
‘business sense’ to be considered. Then, sustainability in the industry context becomes an
ethical issue in which a struggle between short-term economic objectives and long-term
sustainability issues must be faced. Arguments were made that, from this perspective,
engaging in responsible business practices is understood in terms of being a choice as
opposed to being a responsibility. Sustainability, it was argued, should not be subordinated
to immediate outcomes. Instead, it should be feared that not engaging in issues of
packaging sustainability jeopardises the continuation of a business:

In terms of overall profitability, yes, it’s going to cost you money to make
an upfront investment to make your industry more sustainable. But if you
do that you stand the chance of being around. If you don’t make that
investment, you are going to make a considerable amount of money in
the next few years, but then you are going to be out of business.

Design Consultant / Design Consultancy
Another interviewee argued that it is not appropriate to present sustainability as an option. It has to be presented as a necessity. The equation is: what do you want to privilege? Do you want to privilege the long-term survival of your business or you want to privilege short-term returns?

Design Consultant / Design Consultancy

The fear-factor concept portrays concerns regarding the recognition by organisations that they need to engage in issues of sustainability; however, any decision or action taken towards its realisation remains subordinated to other considerations within the decision-making process, particularly to cost and to potential loss of reputation. As a driver for organisations to actively engage in sustainability, then, the fear-factor comes from external factors.

8.1.5 Need for Certainty

The concept of Need for Certainty refers to the degree to which something can be known or understood, or a sense of knowing something. Need for Certainty portrays interviewees’ concerns regarding encouraging organisations to move towards packaging sustainability in terms of the need for reliable information; the relevance of appropriate understanding of issues of sustainability; an assessment of long-term vs. short-term views; and standards already embedded in a design process or organisational philosophy.

For example, some interviewees expressed the view that organisations could engage in issues of sustainability if they had access to trustworthy, affordable information to understand the real issues of packaging materials:

[Organisations need] reliable information that is more readily available on material options. We often look at materials, the recyclability of that material. We don’t understand what the base material is, the resources being used to make that resin type. If we had an LCA available for each of the resin types... that would be a valuable tool for a designer to have access to that information.

Designer / Packaging Company

LCAs are quite expensive and are not available to you. It’s something the company needs to invest in.
Marketer / Brand Owner

We try to [...] give some kind of inspirational examples of packaging and how they could achieve that: multifunction, re-usable, those types of things. Rather than just telling them that they have to make their packaging re-usable; it's about the re-education of the packaging industry.

Design Consultant / Design Consultancy

Others expressed their Need for Certainty in terms of not knowing exactly what packaging sustainability is, which has led them to follow what others say or do. For example:

I know the Australian Food and Grocery Council is involved in this discussion, trying to understand what the definition of sustainability is. We are also talking to them; we are working quite closely with them to be part of that discussion. [...] it's just a ‘vacuum’, I’ve never experienced this in my life where something has been so important, so high on the agenda, and everybody believes that sustainability is a critical issue but nobody really knows what it is.

Marketer / Packaging Company

Yet others expressed their concerns in terms of the need for certainty around what the issues of sustainability were. Misunderstandings and assumptions on sustainability were often a barrier to engaging in issues of packaging sustainability among organisations. Some interviewees highlighted the lack of knowledge on sustainability, the environment, and assumptions made around these issues:

The problem is again that designers are coming from the same thinking that they can get away with packaging, which they can do recyclable and they can do it from recycling materials and that would be OK.

Design Consultant / Design Consultancy

One of the interesting things that I’ve found is, for example, that we talk about global warming in Australia and we inherently link it to the drought. Even though, interestingly enough, global warming and the drought are not linked per se. One is a long-term changing of our environment, the other one has been going for ten years, but it’s a short-term occurrence in the weather patterns. In New Zealand, they talk about global warming but
they are not talking about water, they’ve got plenty of water, the issues there are others.

**Marketer / Packaging Company**

In other instances, interviewees expressed that the Need for Certainty associated with regulations focusing on short-term aspects as opposed to long-term ones, made it harder for them to fully commit to packaging sustainability. For example, one interviewee referred to the lack of long-term focus of the Packaging Covenant and how that discouraged organisations that were already putting strategies in place:

> But I don’t think there is any strong driver for packaging improvements from the environmental perspective in the long-term in this country. I think the drivers that should be in place are those that relate to stronger clarity around the environmental impacts of packaging. They have to be clearly elaborated for stakeholders to understand what the ecological impacts are in the short term but also in the long term, not just the perceptions of what these impacts are.

**Design Consultant / Design Consultancy**

Other examples in which the Need for Certainty was referred to as a driver to encourage organisations to commit to sustainability, was the belief that having sustainability principles or standards already embedded in a design process could help,

> We have a program where we collect used oil containers. We recycle the containers. At the moment, we’re testing the recycled material, but we need to make sure it doesn’t affect the performance of the pack. We do not have a formalised Green Design program, just the fact that our designers understand the organisation’s culture. We try not to introduce products that will harm the environment. We actually use our branding and the way we badge our company as a benefit to the customer. We are working for an environmental purpose.

**Environmental Manager / Packaging Company**

> Having the right information on new materials and technologies as well as on issues of recyclability or LCA’s of your products, and then encourage your organisation to make more sustainable decisions.

**Marketer / Packaging Company**
The concept *Need for Certainty* portrays the nature of decision-making processes within organisations in relation to issues of sustainability. Decisions are based on the degree in which information is comprehensible, available, or verifiable. A main predicament is the practitioners’ lack of expertise, awareness, and/or understanding of issues of sustainability renders the information irrelevant. That is, since the information does not reach the right person or is not in the right format to be intelligible, practitioners are unable to know if they have the right information, hence the *Need for Certainty*.

### 8.1.6 Off-the-radar

The *Off-the-radar* concept implies a general lack of awareness or lack of concern, deliberate or not, about issues of packaging sustainability among organisations. Interviewees’ decision-making processes, therefore, are detached from taking responsibility for the consequences of what they create; particularly, such sense of responsibility is attributed to the nonexistence of well-defined environmental objectives within marketing agendas.

For example, some interviewees discussed the big tension between marketing and design when it came to decisions related to the environment and pointed out to difficulties in trying to create a level of awareness on sustainability issues across all levels within organisations:

> In every industry, there’s always a big tension between marketing and design because design would say ‘Let’s do this’ and marketing would say ‘no the consumers don’t want that’. [Designers] can always get evidence to back up that point of view.

*Design Consultant / Design Consultancy*
If there was something better, in terms of sustainability, that we were not aware of and it was presented by the packaging design department, then we would have to consider what would be the benefits [of design approaches], and also the cost. If we get that balance, then we would change or consider changing [packaging].

**Marketer / Brand Owner**

Other interviewees mentioned that even when corporate responsibility or mission statements were in place, the message was Off-the-radar screen of marketing briefs:

[...] it probably has been off-the-radar screen as far as marketing and sales people’s concern, because they wouldn’t necessarily contemplate it [issues of sustainability]. Educate marketers to start thinking about what will be coming as consumer’s awareness increases.

**Packaging Technologist / Brand Owner**

There's a missing bit between the CEO and me somewhere in the marketing area that it’s a bit “hazy” about the environment. The CEO understands [about environmental issues] but the message doesn’t necessarily gets down […] We are corporate responsible citizens. A lot of the marketing innovation is not driven in those lines.

**Packaging Technologist / Brand Owner**

We have a statement about environmental responsibility. It all goes back to company commitment […]

**Packaging Technologist / Brand Owner**

Along similar lines, others pointed out to the need to have a strategic approach to sustainability within organisations to successfully incorporate sustainability requirements in marketing briefs:

We have sustainability as part of our list of ‘wants’, so as packaging technologist I rank [the environment] very high, but that doesn’t necessarily translates high in the whole process as we have a marketing brief to follow and you have to look at cost.

**Packaging Technologist / Brand Owner**
But once again, the challenge is to deal with marketing requirements, designers can’t do much alone, it has to be more a strategic decision, and it has to come from the top of the organisation.

**Design Consultant / Design Consultancy**

It’s important but it’s not a major consideration for me, I hate to say that but I have a business to run and unfortunately, [the environment] is not a priority. We have done studies and look into recyclable packaging or sustainable packaging and people would say they would buy it. But the reality is that they don’t. And we have to keep packaging at a low cost...

**Marketer / Brand Owner**

From interviewees’ responses, it can be distinguished that environmental considerations in the decision-making processes within organisations are still largely removed from that established somewhat in corporate strategies. Thus, they are greatly disconnected from marketing briefs and design processes. Even when sustainability issues are discussed at the beginning of the design process, this is normally done in isolation. That is, approaches to sustainability tend to not really understanding what the issues are and therefore are frequently unsuccessful.

The concept Off-the-radar grasps interviewees’ perceptions that the integration of environmental considerations in their decision-making processes is not an essential driver for business survival. Organisations still deem taking a more serious approach to sustainability as being an option rather than a necessity.

### 8.2 Organisational approaches and challenges towards packaging sustainability

In this section, two issues interconnected with the required transitions in the AF&BPI towards packaging sustainability are concurrently reviewed. First, interviewees’ perceptions on the tools and information used or required within organisations to make well-informed decisions for packaging sustainability (interview question 10, *appendix A*) are presented. Subsequently, interviewees’ perceptions on challenges faced by the AF&BPI towards packaging sustainability (interview question 11, *appendix A*) are discussed. The relevance of posing such questions relies on the fact that, in order to answer, interviewees had to reflect on their decision-making process and unavoidably assign responsibility to whether decisions are made and/or actions are taken, and reasons for them. By discussing these
two issues it is possible to elaborate propositions to answer research question [D] regarding the transitions which are required to move towards packaging sustainability. Figure 8.7 illustrates the relationship between these two sets of data and research question [D].

Figure 8.7 Relationship between interview questions 10 and 11 and research question [D]

8.2.1 Tools and information for packaging sustainability

Data regarding interviewees' perceptions on tools and information used or required within organisations to make well-informed decisions for packaging sustainability (interview question 10, appendix A) is discussed here. Interviewees' responses allowed for the elucidation of issues that arise at specific points in decision-making processes within organisations, and what the practices for dealing with such issues are. Figure 8.8 presents selected edited extracts from interview data from this question.
Figure 8.8 Summary of condensed responses to interviewees' perceptions on question 10 ‘tools and information used/required within organisations’
The answers to these questions varied; however, there was a general perception that a lack of available packaging-specific tools and information for organisations in Australia was one of the major obstacles to making well-informed decisions for packaging sustainability. There were those who expressed their concerns in terms of the absence of an industry-wide understanding of what the issues of packaging sustainability were. Some interviewees also pointed to the lack of sustainability objectives within organisations as a common issue hindering the implementation of strategies and/or making the use of tools to support decisions for packaging sustainability difficult. Communication among those involved in packaging-related decisions within organisations, but also among stakeholders, was regarded as a key issue for making more informed decisions.

Other interviewees focused on what was perceived as the most critical issue for changing business practices, namely the inadequate professional training or education of those working in the AF&BPI. Difficulties associated with this lack of expertise were also expressed in relation to how decisions were made and which stakeholders had influence in the decision process. Other interviewees referred to a top-down approach, which enabled them to obtain appropriate resources in knowledge and information to make more informed decisions.

### 8.2.2 Industry challenges for packaging sustainability

Data regarding interviewees’ perceptions about challenges faced by the AF&BPI in moving towards packaging sustainability (interview question 11, appendix A) are discussed here. The relevance of even posing such a question is that to answer this question interviewees needed to assign responsibility concerning the perceived issues, including their own responsibility towards packaging sustainability. Figure 8.9 presents selected edited extracts from interview data on industry challenges for packaging sustainability.
Figure 8.9 Summary of condensed responses to interviewees’ perceptions on question 11 ‘challenges faced by the AF&BPI towards packaging sustainability’
8.2.3 Recurrent themes on issues of the packaging industry

Figure 8.10 presents the initial coding process, and the identification of recurrent themes (refer to Table 4.3), for interviewees’ perceptions regarding information needed to make more educated decisions for packaging sustainability. The two recurrent themes found were: education and communication and direction.

[ selected edited extracts from data ]

The use of PIQET or a simple LCA, but used as a guide to be aware as to where should we be heading.

If a company says: ‘we’re moving to more sustainable products and packaging; good designers will find a way to do so, even if they don’t have a huge amount of knowledge, they will find out the information.

Most tools are not used by designers. LCA’s are way too complex, the way the information comes out, even if it useful, it does not translate into things that designers think about.

Working in collaboration and have feedback from other stakeholders.

Not regarding decisions as separate design tasks but seeing the design task as working through the relation of everything that involves a product.

We’ve done a fair bit of work in terms of environmental awareness within the company, is always in the back of our minds, when we design.

LCA-like tools but an internal ranking system or internal score cards that allows to assess the environmental performance of the company but that is also cost-effective.

Long-term thinking and planning.

As a packaging ‘guru’ I should know about issues of sustainability, but my background is food technology. I’m not specifically qualified in packaging.

Packaging sustainability is a terribly over-discussed issue. The solutions are really straightforward. Integrating environmental objectives within that design process.

Everybody is in the dark when it comes to understand or define what is sustainable; nobody’s drawn a standard.

[ recurrent themes ]

Education and communication: finding out the information; information from tools does not translate into things that designers think about, environmental awareness; not qualified in packaging.

Direction: being aware as to where to be heading; design through everything that involves a product; assessing environmental performance; being in the dark; integrating environmental objectives in design.

Figure 8.10 Initial coding process for interview question 10
Figure 8.11 presents the initial coding process, and the identification of recurrent themes (refer to Table 4.3), for interviewees’ opinions on industry challenges for moving towards packaging sustainability. The two recurrent themes found were: **miscommunication or misunderstanding** and **long education chain**.

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**[selected edited extracts from data]**

Moving manufacturing plants to countries with cheaper labour costs, sourcing from overseas.

Getting suppliers on board; improving their environmental performance. Then, if our customers can recognise what we’re doing and benefit from that they can also influence change within their business. Then, there’s a big roll-on effect.

One of the problems is legislation focusing on recycling; giving the wrong message to industry.

The challenge is to steer the debate in the right direction. A unified vision on what is ‘sustainable’.

There’s a missing link between the CEO and me. The message doesn’t necessarily get down; a lot of the marketing innovation is not driven in those lines.

Communication between industry, consumers, and recovery facilities and other in the supply chain.

The people making decisions may not have the education in terms of knowing the choices that they are making and what it actually means.

One of the biggest challenges is the lack of political will to do something about it. There are some good things but generally, a challenge is still the lack of good policy and regulation.

For Australia: geographic spread vs. population size vs. impact in the global packaging market.

Long education chain: we have to make some really key decisions; how do we educate the wider community on the misconceptions around packaging. What role do we have to play in that?

Lack of leadership is a big challenge from the industry point of view. Many Australian companies are strongly influenced by their parent companies.

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**[recurrent themes]**

**miscommunication or misunderstanding**: wrong message to industry; steer the debate in the right direction; missing link, message doesn’t necessarily get down; people making decisions don’t have the [right] education.

**Long education chain**: educating the consumers; getting suppliers on board; Communication between stakeholders in the supply chain. Big roll-on effect; lack of leadership.

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Figure 8.11 Initial coding process from interview question 11
Then, Figure 8.12 brings together the recurrent themes from each set of data showing the final coding step in which two larger concepts were generated:

1. being in the dark (Section 8.2.4);
2. missing link (Section 8.2.5).

![Diagram showing final coding process for interview questions 10 and 11]
8.2.4 Being in the dark

The concept of being in the dark was related to those instances in which interviewees believed that, despite all the resources and information available to them and to the industry, the issue of packaging sustainability was not understood. Being in the dark also reflects interviewees’ concerns on the lack of guidance towards packaging sustainability, either internally or externally from other organisations.

A national higher level of understanding [is necessary]… or maybe it’s a definition of what is good environmentally, and I come back to this thing about materials and not being able to tell anyone whether we should be using a PET vs. a HDPE bottle.

Packaging Technologist / Brand owner

I don’t have enough information to be able to tell anyone the environmental impacts of all materials [...] Should we biodegrade, should we recycle, which of those things should we do? So until there’s policy decision around, or at least directing us as to what is “good” [and] what’s “bad” or “less good”… For example, there are a lot of biodegradable materials around, […], but in terms of business sense they make no environmental sense, until we’ve got systems to do something with them. […] It would have to be a policy, a government thing. So I think until policy is properly sorted, that would dictate [how we approach sustainability].

Government leadership, as simple as that.

Packaging Technologist / Brand owner

According to the above presented interview responses, policy and government guidance are regarded as to be one of the major guidelines in facilitating better understanding of design for sustainability. Along the same lines, others mentioned that it was important to understand the operation of kerbside recycling systems as well as effective communication to consumers of decisions made in regards packaging materials and its end-of-life management:
people making those decisions may not have the education for knowing that the choices they are making are actually right [...] we might have a logo on the packaging but we don’t understand the effects of it and which are the best options for us to make.

**Marketer / Brand Owner**

 [...] probably education, it’s one of the biggest challenges. If there are better options out there from what we are using at the moment [in terms of end-of-life management], we are not aware of them.

**Marketer / Brand Owner**

Education and communication across all levels including organisations, consumers and government was also regarded as an important part to enable better decision-making processes:

[Integrating] Knowledge and attitude into business programs: viable easy-to-use tools.

**Packaging Technologist / Brand Owner**

Another thing that has been an ongoing thing is educating the consumer. Efforts and resources have been put into educating the consumer but still they are driven by price, quality or brand name; rather than other issues. This is where the problem with labelling is: few people actually read the label, especially if is crowded with other things, it is not easy to understand.

**Policy Maker / Governmental Organisation**

Consumer perceptions’ are connected to their buying choices and preferences. They are not putting their money where their mouth is. And we are making money by selling products to consumers, if consumers don’t buy it, we don’t make money.

**Marketer / Brand Owner**

A major concern among interviewees was having a source of reliable information that could dictate the steps to take regarding packaging sustainability. However, there was recognition of the complexity in its implementation:
It would be very difficult to have a specific document that outlines everything because the technology is changing so quickly that you’d almost have to update it every month.

**Packaging Company / Designer**

[We need] something that allows assessing the environmental performance of the company but also is cost effective.

**Environmental Manager / Packaging Organisation**

Implementing a unified system for managing packaging materials [...] but it also depends on the system of the country in which packaging is.

**Design Consultant / Desig Consultancy**

Other interviewees recognised that things need to change in the larger scale within industry to effectively move to packaging sustainability. A main constraint, however, was the lack of direction and sense of confusion around sustainability issues across the industry as a whole,

*Things got to change across the industry. One of the problems is that the legislation out there is focused on recycling, so it’s basically giving the wrong message to the packaging industry. It has to go back to ask fundamental questions.*

**Design Consultant / Design Consultancy**

Organisations within the packaging industry still think that if they use paper, and paper is recyclable then everything is alright. They don’t seem to understand what the real issues are they are really focused on recycling or making it recyclable.

**Design Consultant / Design Consultancy**

The Australian market is not sufficiently large to be able to have the same kind of take back capability as [end-of-life management systems] in Europe. The distances in this country are very problematic but not only in terms recovery or products or packaging but also in terms of initial distribution.

**Design Consultant / Design Consultancy**
The concept *Being in the dark* portrays interviewees’ perceptions on information and tools required as well as industry challenges. A lack of direction and lack of government leadership is identified as a main constraint in decisions related to packaging sustainability. Emphasis also was made on the need for education and communication between and within organisations in addition of having a reliable source of information. Ultimately, the recognition that things have to change across the whole industry was an important element of the *Being in the dark* concept.

### 8.2.5 Missing link

The *Missing link* concept emerged from those instances in which interviewees believed that one of the major challenges to industry was the miscommunication across, and between those involved in design practices within organisations. It also referred to those instances in which information or knowledge was not appropriately passed on or understood by all those involved in decisions of environmental sustainability. For example,

> There’s a missing link between the CEO and me somewhere in the marketing area that’s a bit “hazy” about the environment. The CEO understands [about environmental issues] but the message doesn’t necessarily get down… we are corporate responsible citizens. [But] a lot of the marketing innovation is not driven in those lines.

**Packaging Technologist / Brand Owner**

Whilst it has been recognised by companies that major levels of improvement have been achieved through the NPC, some participants considered that because regulation plays a key factor in encouraging companies to act towards packaging sustainability, therefore, it needs to be leading in the right direction. In light of this, interviewees criticised that the NPC objectives do not necessarily address packaging sustainability in the most appropriate way. Instead, the argument was that there has not been a real and strong government commitment to enforcing that regulation, nor to working together with industry to achieve real sustainability objectives.

> Regulation [is needed]. I think it needs to be smart regulation: regulation that involves industry and designers in drafting that legislative and regulatory framework. So there is a need for government to play a key role in stimulating industry, mandating industry to improve its environmental performance, and then it needs government to make a commitment to enforce it. So those companies that are not complying face some sort of
consequence. [...] I think the Packaging Covenant is a total failure. I think it really has been a way of re-branding a whole lot of existing basic activities by industry.

**Design Consultant / Design Consultancy**

The issue argued above is crucial, not only in terms of the impact that regulation and policy have in the actions of companies in their attempts to comply with specific measures prescribed in such frameworks, but also in terms of the implications of badly planned and thought-out regulation in which governments have a greater responsibility.

The Covenant came about as a result of lengthy discussions between all levels of government and industry regarding the issues surrounding the economics of kerbside collection of packaging materials. These discussions also raise other concerns, such as the need to understand the 'real' issues of packaging sustainability through the discussion between government and industry, as well as the acknowledgement of industry initiatives that have resulted in positive outcomes. The latter was expressed as follows:

> There are some pioneering companies that are doing good work, and the Packaging Covenant has made it easy for that to happen. But I don’t think there is any strong driver for improvement of packaging from the environmental perspective in this country. I think the sort of drivers that should be in place are those which relate to much stronger clarity around the environmental impacts of packaging that are very clearly elaborated, and [in which] stakeholders understand what the ecological impacts are, not just the perceptions of what these impacts are.

**Design Consultant / Design Consultancy**

Another important issue to be considered is the imperative need to acknowledge that legislation cannot work in isolation; interviewees suggested it must recognise other issues and influences within the packaging industry that might affect its efficacy, such as the internal drivers of companies:

> I think the [current] drivers [for packaging sustainability] are a bit of marketing really, a bit of the Packaging Covenant, some companies who are progressive and are doing the right thing. Overall, I don’t think government policies have done the right thing or are doing the right thing, I think there are some individual companies that see the value in adding
environmental performance to all the other things they are trying to achieve from their packaging.

Design Consultant / Design Consultancy

It was interesting that a participant pointed out an obvious duality in regulation: it can result in action through the ‘fear-factor’ but can also be seen in terms of the ‘rewards’ of complying:

Regulation has a big influence among industry, you know, the carrot and stick approach. In terms of stick, it is carbon tax because it’s inflicted, and as they say ‘Necessity is the mother of invention’. In terms of carrot: a really good showcase of successfully commercial sustainable projects and maybe a resource to help people do it.

Brand Consultant / Brand Consultancy

The Missing Link concept portrays two key issues of design practices within organisations: miscommunication and need for education. The miscommunication between those involved in design practices is mainly the result of organisational structures and organisational roles characterisation. The other aspect that is crucial for ensuring that adequate decisions are made is to increase the level of education and expertise on issues of sustainability of those involved in decision-making processes. Organisations need to actively take responsibility for their actions will become the key the preparation of such education; further, the packaging industry needs to recognise that it is not only the role of governments for taking action towards packaging sustainability.

8.3 Repositioning design practice

In general, interviewees acknowledged that organisations needed to consider issues of packaging sustainability. However, economic constraints and conflicts with marketing objectives were pointed out as the major reasons for insufficient industry engagement with issues of sustainability. Others recognised that drivers to engage in issues of packaging sustainability could be related to competitive advantage. There were also those interviewees that perceived that external factors or influences were significant drivers to engage organisations in packaging sustainability. A general tendency to regard environmental considerations as a high priority in decision-making processes prevailed. Nevertheless, interviewees noted that such ranking varied according to the type of organisation and/or interviewees’ own level of involvement in packaging design decisions.
The Fear-factor concept refers to the extent to which the influence that external factors play in decision-making processes keeps one from doing something or prevents or allows an action due to fear. The concept of Need for certainty refers to the degree to which something is done based on what is known, understood or a sense of purpose to do something. The concept Need for Certainty portrays interviewees’ concerns regarding encouraging organisations to work towards packaging sustainability in terms of the need for reliable information; the relevance of appropriately understanding issues of sustainability; an assessment between long-term vs. short-term views; and standards already embedded in a design process or organisational philosophy. The concept Off-the-radar takes account of the disengagement with issues of sustainability in organisational corporate strategies and marketing briefs. It also accounts for the level of unawareness/interest in issues of sustainability among practitioners.

The Being in the dark concept draws on the relevance of recognising that a major change needs to occur in how the industry as a whole approaches issues of sustainability. It also points out to the perception that lack of real direction and leadership from governments prevents actual change towards sustainability. The Missing link concept portrays miscommunication issues that result in a mistaken understanding of issues of sustainability and need for education within and across the whole packaging industry towards packaging sustainability.

From the analysis of the concepts generated from this set of data, two larger propositions were further developed in order to answer in a conceptual manner research questions [ C ] and [ D ]. The three concepts Fear-factor, Need for certainty, and Off-the-radar were brought together to develop a proposition named Option or necessity? This proposition answers research question [ C ] How the structure of the AF&BPI influencing the setting and the realisation of packaging sustainability? The two concepts: Being in the dark and Missing link were brought together in proposition named Lost in translation. This proposition answers research question [ D ] What transitions are required to move towards packaging sustainability? Lost in translation and Option or necessity? are discussed in Chapter [ 9 ].
[part c]

Discussion and conclusion

The last [part] of this thesis consists of the formulation of a series of theoretical propositions derived from the analysis of the interview data; these propositions correlate with the research questions.

[part c] is set out to present a concurrent discussion of the relevant literature and interview data, elucidating how the research findings fit within the theoretical context of the broader research area. It presents the final chapter of the thesis:

Chapter [9] A transition to packaging sustainability brings together research questions [A], [B1], [B2], [C], and [D] and correlations with the literature. After discussing each research question independently, this gives answer to research question [E], the ultimate question of this investigation.
Chapter [ 9 ]
A transition to packaging sustainability

Section 9.1 points out the significance of undertaking the current research project and what it brings in terms of the perceived changes and obstacles of the role of design practice in sustainability. As explained in Section 1.5, the analysis presented here is based on correlations made between interview data, and literature that became relevant by emerging alone from the data.

Section 9.2 addresses research question [ A ]. It discusses issues of the setting and character of design and design practices within the organisational context of the Australian Food and Beverage Packaging Industry (AF&BPI). The proposition of design practice as a Frame of reference is discussed in its three variations: fixed, flexible and versatile.

Section 9.3 gives answer to research question [ B1 ]. It discusses two paradoxical propositions related to complexity and invariability, which, according to analysis of interview data, define the role of packaging. It also describes issues of packaging’s configuration portrayed by two other propositions: The next thing and More, not better.

Section 9.4 answers research question [ B2 ]. It discusses issues of packaging sustainability portrayed through the proposition sustaining the unsustainable.

Section 9.5 gives answer to research question [ C ]. It discusses perceptions of issues relating to the structure of the AF&BPI, which interviewees believe are influencing the setting and the realisation of packaging sustainability. Three concepts here portray interviewees’ concerns: fear-factor, certainty and off-the-radar. Then a final proposition is made: option or Necessity.

Section 9.6 answers research question [ D ]. It discusses issues related to the transitions that are required to move towards packaging sustainability. Two concepts relate to this, and were named being in the dark and missing link. Then a final proposition is made: lost in translation.

Section 9.7 addresses research question [ E ]. It comprises the contribution to knowledge from the research findings, specifically in relation to the directions of packaging design practice towards sustainability.

Section 9.8 discusses the limitations of the research findings.

Section 9.9 discusses the implications of the research findings in relation to regulation regarding packaging sustainability.

Section 9.10 identifies research opportunities for future work.
9.1 Change and obduracy in the role of design practice

Section 1.2 was concerned with key moments in history from the 1960s onwards introducing the critical environmental and social sustainability issues resulting from industrial activities into the global discourse. An important observation of this section was related to the dual pressures on the role of design over the last five decades, in bringing benefits to society and, at the same time, aggravating environmental issues through the products and outcomes of its practice. One of the most documented critiques, indeed accusations, of the design profession was made by Victor Papanek in 1972. His claims were based upon the connection between patterns of production and consumption and the role of design in promoting a growing material culture without consideration of its social and ethical responsibility. A major implication of Papanek’s criticism is the progressive awareness around social, economic and environmental issues that has emerged in the practice of design. This eventually resulted in the introduction of laws and regulations by governments to force, or encourage, organisations to improve practices through design. As such, numerous and varied design approaches and strategies have been developed and genuine efforts have been made by some organisations to practice corporate responsibility.

The progression of business approaches towards considering the environmental issues within industrial practices was briefly presented in Section 1.2: from the reactive approaches experienced in the 1960s; to the social and economic commitments embraced in the 2000s; and the proactive engagement approach widely adopted by the 2010s. Interestingly, it seems that Papanek’s nearly 40-year-old arguments on the need for responsible design practice, and for a change in the approach to that being designed, have only now begun to be considered within organisations and in the broader sustainability discourse. Most importantly though, and despite the interval, they have set the foundation for challenging mainstream views on the role of design, which are based in the notion of post-industrial material culture.

In Section 2.1, it was established that while many design theorists and practitioners have attempted to define the role of design, these have often resulted in paradoxical and mystified perceptions of design. Thus remains a prevalent ambiguity in the characterisation of the role of design. One reason attributed to this was the long-standing divergence between the theory and practice of design over the past half-century. Section 1.4 explained that the motives and intentions of design in practice have remained, to a great extent, subordinated to notions of economic growth and progress. Furthermore, the literature of design largely continues to portray its practice as concerned with the
development of mass-produced objects within industrial contexts, which reinforces mainstream views of design. Conversely, as discussed in Section 1.1, governments and design practitioners have increasingly embraced the view that design plays a role in sustainability (UNEP 2004, 2005, 2009). However, the role of design in sustainability is still on its journey from being an alternative approach to being an indispensable part of its practice.

Diverse literature on eco-design and design for sustainability has arisen in the last few decades, which has provided a starting point for design practitioners to acknowledge and address the environmental and social issues associated with the results of their activities. A range of resources on issues of sustainability have also been developed for design practitioners and industry: indicators, metrics, frameworks, decision-making instruments, toolkits, online resources and paper-based publications exist in a variety of design contexts in many countries where design takes place. In reviewing the existing literature, it was found that while a positive contribution has been made in the many publications on design for sustainability, the focus has to a great extent been placed upon the product and issues of its life cycle. While the advantages of adopting this approach have been widely recognised, a major constraint is that it separates key decisions into two different processes: first, those decisions involved in the creation of a product concept, and secondly, those made throughout its development.

The role of design practice in sustainability is widely understood as the application of a variety of strategies to improve environmental aspects of products and their packaging. Such a view of design reinforces the current notion that the very nature of design could be captured as a problem-solving activity in which little or no room is left for design to be a problem-defining activity. Moreover, the role of design is set, based upon a formulaic or step-by-step approach to a design problem or situation. The latter has been addressed in depth in the literature of design; however, a major implication of this is that the ethical and social responsibility that design has in both production and consumption remains detached from current practices. This is related to the definition given by the Brundtland Report (WCED 1987) regarding sustainable development, which is broad and open to interpretation; at the same time though, it carries implicit notions of economic growth as a main driver of human activities. Section 1.3, elaborated on arguments made by Wolfgang Sachs (1999) on how sustainable development (SD) tends to emphasise economic development as a common objective. It was also established that SD, as a concept, deems natural resources as to be negotiable to achieve economic objectives, often failing to capture the intrinsic ethical and social dilemmas that accompany any action taken. Sustainability, as a concept, on the other hand is ‘detached’ from considering
economic development or increasing material capital as an implicit objective. Instead, it portrays principles of ethics, social justice and environmental conservation as the main, non-negotiable concerns, and as the foundation for achieving a balance of interests in the world, including economic ones, with a view to the long-term future.

In this, the old debate becomes relevant again: are current design paradigms still valid? Is design an agency of change for sustainability or a promoter of unsustainable ways of producing and consuming, and ultimately of living? In order to affect a real shift in consciousness around sustainability and design, recognition of the environmental impact that industrial practices have, through the depletion of living systems and resources, must prevail. The possibilities of replacing nature’s contributions to wellbeing with material capital are limited, and thus any significant and irreversible negative impact must be kept to a minimum (Sachs 1999).

It has emerged through this research that design motives and practices need undeniably to undergo significant transformations: they need to evolve in both their epistemology and their ontology in order for design to successfully become an agent of benign change in sustainability. To significantly advance the role of design for sustainability, contemporary design theories indicate that it is essential to review and acknowledge the complexities and implications of existing notions and practices of design within real contexts (Section 1.4).

This investigation was embarked upon to develop a series of hypotheses that account for the research situation: what is design? and, how are design practices conducted within specific contexts? Only then was it possible to ask, what is the role of design in sustainability? The main objective was to develop the “how and why” of design practices in organisations within the Australian food and beverage packaging industry context, in order to then generate hypotheses to articulate the broader role of design in sustainability (Section 1.4). In reviewing current practices of design within such a context, it emerged that there is major confusion within the industry as to what design is, and more importantly, who makes up its practice and what the implications of that are. Design is still widely regarded as limited to an activity or a process primarily concerned with creating objects and, as a result, its role is also limited. The research elucidated different reasons for this, however what emerged was that even when there was an intention to go beyond such understandings of design, by both practitioners and organisations, the current setup of the industry in many ways prevented this. That is, organisations within the industry rely heavily on the use of packaging to achieve their marketing objectives, and as a result of this the character of their practices is set to serve that purpose. This includes design practices.
This investigation took an interpretative approach to the research: it explored relevant social actions to which those being studied attach subjective meaning embedded in the meaning system that they share (Section 4.2). The emphasis was put on the actualities themselves, as well as perceptions and beliefs around issues pertaining to the practice of those involved in the planning and design of packaging.

In using a Grounded Theory approach to collecting and analysing data, it was possible to identify the main concerns of those involved in design practices with empirical data collected through interviews (Section 4.3). This approach was utilised as opposed to a more traditional research methodology, which would make the data fit into preconceived concepts. Using the Glaserian GT approach in this research was also appropriate since its outcomes were determined by theoretical saturation as opposed to finding a representative sample of the area of study. The Glaserian approach allowed for the conception of an emergent theory with respect to interviewees’ own understanding of their reality based on the nature of the roles they take on, ways of handling such roles, and paths of action for performing them. Furthermore, such theory consists of a set of hypotheses about the ideas and ways of thinking of those involved in design practices, which it is crucial to interpret in order to assign meaning to their roles. Then, it was possible to make a critical reflection on the essential transitions required in both design practices and the industry in order to provide explanations on how design effectively contributes to sustainability. Such transitions account for the explanation of core concepts generated from the data. This thesis then explored current perceptions on these motives and practices in order to develop recommendations for change.

Six research questions were posed to articulate the role of design practice in sustainability. The answers to those questions are based on interviewees’ perceptions of their social reality, which provides an understanding of what is required to effectively actualise the role of design in packaging sustainability. It is on the latter that the relevance of this research relies. The question thus to be answered is: what are the essential transitions required in design practices to actualise the role of design in packaging sustainability? The answer to this question is provided throughout the following sections.

9.2 Research Question [ A ]

The Fixed, Flexible and Versatile setting and character of design

In Chapter [ 2 ], a variety of conjectures on the character of design were reviewed based on existing literature on design. Suggestions were made that the role of design has been
influenced by economic models and the social setting in which design is practiced (Section 2.1). More specifically, Victor Margolin (1989) in his book Design Discourse: History, Theory, Criticism, points out that many attempts to develop design theories have been made without the consideration of the historical context of design practices (Section 2.1). A major implication of this is that without an understanding of how economic models are fundamental drivers for major changes in societies, the role of design cannot move in the direction of sustainability.

It is worth noting here that during the Industrial Revolution, the growing use of technology, allowed for improved manufacturing processes; together with the greater availability of materials, an economic model of mass-produced objects prevailed (Fuad-Luke 2009). Improved manufacturing processes brought the alienation of designer from production, as well as the division of labour, de-skilling and product standardisation. Interestingly, different UNEP reports (2004, 2005, 2009) on sustainability have identified a link between production and consumption, a significant factor which industries are required to acknowledge in their practices. However, organisations largely still see production and consumption practices as different processes and not as two components of an integrated single system (see Section 1.3). Further, design for sustainability within organisations has often been set to focus only on the life cycle perspective of products, in which a main objective is to address isolated environmental issues, particularly those at the end-of-life management of materials, as opposed to radically influencing production and consumption patterns (see Section 1.4).

For example, a common understanding of the role of design within organisational contexts has predominantly been associated with responding to commercial briefs. Subsequently, design has largely been portrayed as concerned with decisions related to the appearance and technical specifications of mass-produced objects (see Section 1.4). As discussed in Chapter 1, Fry (2001) pointed out two major contexts of practice as reasons why the role of design is disconnected from critical design decisions: 1) the practice of design for servicing the purposes of an industry, and 2) the embrace of restricted views of the role of design by designers themselves. According to the discussion on the characterisation of design in Section 2.1, the reasons for such understanding of design have their roots as far back as the 1700s, with the beginning of the Industrial Revolution, when design was set to conceive of objects of high aesthetic quality (Walker 2006). In Chapter 2, it was noted that, according to design historian Guy Julier (2005), notions of design moved back and forth between craftsmanship and artistic invention throughout the nineteenth century. It was at this point that a major reconsideration of the value of mass production took place, since it seemed to limit the role of design to a mere ‘form
A perception that important elements of design were removed from its practice, including high quality standards and an appreciation of the dignity and value of good design, prevailed through to the twentieth century. Then the Arts and Crafts movement emerged as a reaction against the styles that were developed by machine-production. Since the 1940s, when design became a professional activity, many connotations have been given to design and no actual consensus has been reached as to what the distinguishing elements of its practice are (Section 2.2). As explained in Section 2.3, two main characterisations of design, however, have prevailed: design as problem-solving activity and design as problem defining activity. In the first, design is a rational and linear problem-solving process such as the one proposed by Herbert Simon (1969); the second, promoted by Donald Schön (1983), describes design as a process of ‘reflection-in-action’.

An underlying premise of this investigation was that for considering design as an agency of change for sustainability, design theorists have identified the indispensability of undertaking a major revision of current design practices (Section 1.4). This investigation explored the current setting and character of design, and how design practices are conducted, within the organisational context of the Australian food and beverage packaging industry (AF&BPI). The main objective was to review design practices to understand the situation as it is as opposed to engaging on issues of organisational management theory. The final sampling consisted of thirty-six interviewees from twenty-two different organisations. The sampling size was determined by theoretical saturation, in line with the Grounded Theory method used, as opposed to finding a representative sample of the area of study. The interviews were conducted during the period of February 2007 to June 2008. Interviewees from different organisations made up the initial interview sample: brand owners; design consultancies; brand consultancies; packaging manufacturers; packaging consultancies; retailers and government agencies. Those involved in the interviews were situated within different areas of organisations, including packaging design, packaging technology, marketing, environment, policy-making, procurement, retailing, and those with design for sustainability expertise. The relevance of having such a diverse range of interviewees is that it allows an investigation to reflect what happens in reality and provides a more accurate picture of the phenomenon being studied. According to the Glaserian GT method, reviewing in the above manner enables the identification of interviewees’ main concerns (see Section 4.3.2), and correlations can then be made between their definitional arguments around the current role of packaging and issues of its configuration. Further, it is possible to explain how such concerns affect their decision making processes.
Three sets of data from the interview schedule (interview questions 1, 2 and 3 respectively; appendix A) were reviewed in Chapter 5. Based on the analysis of interviewees’ perceptions and understandings of their roles and responsibilities, as well as their involvement and interactions with others in packaging design situations, concepts were generated from three recurrent themes; these were categorised further in three main propositions (see Section 5.2). As explained in Section 5.1, the significance of interviewees’ own interpretations of their roles lies in the fact that they revealed their main concerns and their ways of resolving them. That is, they characterised their roles based on that which motivates their actions and, hence, their decisions.

The recurrent themes found in these three sets of data were related to the nature or character of roles, ways of handling roles, and paths of action or interaction with other stakeholders. From these recurrent themes patterns or concepts were generated; these, subsequently, were abstracted in three propositions. Design practices within the organisational context are thus situated in three different Frames of reference: fixed, flexible and versatile. These Frames of reference account for variations in patterns of behaviour, and portray a representation that is inadvertently constructed by these behaviours. The Frames of reference are conceived with respect to the beliefs of interviewees regarding the nature of their roles, the ways of approaching them and the paths of action for performing these roles. They are further defined according to the nature or character of roles, the way these are handled, and the paths of action they must take (Figure 9.1).
Following the above discussion, answer to research question \([ \text{A} ]\) is given here.

**What is the current setting and character of design, and how are design practices conducted within the organisational context of the AF&BPI?**

Design practices are **Fixed**, **Flexible** and **Versatile** within organisations of the AF&BPI.

The current setting and character of design within the AF&BPI is based on the three main connotations named **Frames of reference**. The framework named **Frames of reference** is a theoretical conceptualisation of design practices, is useful in that it allows for the depiction
of their character in terms of movement. This movement refers to the ways that practitioners position themselves in a particular design situation, as opposed to physical motion. The three variations of the Frame of reference established here are self-imposed by those involved in design practices; therefore awareness and intentionality are distinctive aspects of each variant of the Frame of reference. The level of awareness and intentionality varies once the proposition Frames of reference has been adopted; actions and thinking processes are delineated by it. Roles in the fixed Frame of reference are static; those which are flexible are active and those which come under the versatile variant are proactive. Such positions can be transformed once practitioners become aware that they create the reality of their practice. Conflicting connotations given to design within the industry is one of the key constraints for design to contribute to packaging sustainability. That is, the role of design within organisations is restricted to that of a mere vehicle for the materialisation of already proposed packaging solutions.

The design practice in the packaging industry is therefore largely restricted by the internal processes of organisations, situating design expertise in the lower levels of the hierarchy. However, if design expertise is sought outside an organisation, its role is dramatically altered, from being constrained to being interventional, or even bringing a strategic approach. Such an interventional role gives a completely different dimension to the ways in which design can contribute to packaging sustainability. If packaging sustainability was understood as a communication strategy, organisations would benefit by of adopting a versatile frame of reference in which it would be possible to redefine sustainability objectives as well as business objectives. The majority of those involved in design practices within organisations of the AF&BPI, however, oscillate between adopting a fixed or flexible Frames of reference. Design practice within the industry is still largely regarded as being principally involved in technical aspects of a packaging solution. This observation reaffirms the notion that design is a problem-solving activity. A major issue is that those involved in design practices are unaware that regardless of their perspective or background, they are part of design practices. That is, marketing, environmental, and procurement departments, among others, are often divisions within organisations which resist understanding design as a multidisciplinary practice.

9.3 Research Question [ B1 ]

Complexity and Invariability in the validity of packaging

Packaging has been widely perceived as a fundamental element of contemporary food systems. As a result, both the current role of packaging and its very existence go largely unquestioned. The definition of packaging, in terms of it being the design problem, has
already been predefined as the ‘solution’ to resolving the multi-function problem of containing, transporting, merchandising a product throughout complex supply chains. It is precisely this predefinition that appears to be a major constraint for change. The potential to reassess the role of packaging is thus very limited, and proposed alternatives pass unnoticed by those involved in design practices. A major issue that explains the latter is that packaging has become an industry in and of itself; as such the production and continuation of packaging is at least expected, at worst imposed. In terms of sustainability, one of the implications of this is that this presupposition essentially negates the possibility of changing the packaging paradigm, that is, moving towards the inexistence of packaging, by prioritising the product-packaging relationship. Design has little or no influence on the definition of such a prescribed need for packaging. Another major implication is that design decisions are limited to resolving the physical configuration of packages; hence, design is perceived as a problem-solving activity (see Section 2.1.1). The role of design is thus one that is predefined as the means of solving a predetermined problem.

Based on the analysis of interviewees’ perceptions on the current role of packaging (interview question 4, appendix A), concepts were generated from three recurrent themes which were categorised further in three main propositions (see Section 6.2.1). The stages of analysing interviewees’ perceptions regarding the current role of packaging are portrayed in Figure 9.2.

**Figure 9.2** The stages of analysing interviewees’ perceptions regarding the current role of packaging (interview question 2)

*Figure 9.2* also denotes that the wide range of interviewees’ perceptions and beliefs influenced the formulation of packaging as a design problem in which the many expectations on its role were often paradoxical. According to interviewees’ the current
role of packaging can be defined in four major aspects: fundamental, technical, merchandise-oriented and multi-purpose. Through recognising interviewees’ main concerns when characterising the role of packaging, it is possible to go beyond inherent inferences about such a role and explain interviewees’ interpretations. Moreover, it is imperative to distinguish the implications of the diverse range and nature of the paradigms and struggles around the idea of packaging and notions of sustainability. From the analysis of such responses it is possible to elucidate, how in the view of interviewees, the problem of packaging is formulated. From here, it is possible to extract reasons for their ways for resolving this problem. Paradoxically, it seems that a critical limitation for actualising packaging sustainability is the current role and configuration of packaging.

Section 2.4 presented arguments on how the current industrialised production system, which is principally driven by economic objectives, reinforces the creation of more products and thus encourages consumption. It was highlighted that the increasing material culture is a major burden for the immediate transition to sustainability. Mainstream business models still consider environment-related decisions to be subordinated to economic considerations. The same applies to the food and beverage packaging industry, which perceives packaging as a marketing tool and still heavily rely on it to merchandise their products. To genuinely move towards sustainability, a revision of the conceptual basis of packaging needs to occur first. Even if a life-cycle approach has been adopted to lessen its environmental issues, a redefinition of packaging as a product and its role in current food systems is indispensable. Asking very fundamental questions of design include: is packaging in its current configuration needed? And, if so, why? (Figure 9.2). Only by challenging the conceptual basis of packaging, that is, its Complexity and Invariability, will it be possible the dematerialisation or elimination of the unsustainable aspects of packaging.

While the common tendency for considering the role of packaging essential may appear to be valid, the concept or idea of packaging is one that has been artificially created by both a society and an industry that perceives and uses packaging to serve their purposes. To interviewees, packaging seems as readily intelligible as those purposes themselves. The significance of the role of packaging is simply taken for granted and assumptions around the functions that are accomplished through packaging make its existence apparently indispensable. Interviewees’ main concerns relate to persistently validating the need for packaging. A main issue is that packaging is perceived as necessary because it helps in moving products efficiently while considering the requirements of a variety of individuals and organisations involved from the point of extracting raw materials, through manufacturing, and distribution, to consumption by the end user. The preoccupation with
this validation is that such complexity attributed to the role of packaging makes it difficult for interviewees to even consider a shift in the way the food system is conducted and maintained. Furthermore, the production of food and beverage packaging has been established as an industry in its own right and for those involved in such an industry, the mere consideration of the indispensability of packaging seems inconceivable.

In terms of the nature of the configuration of packaging (See Section 6.3), according to interviewees’ perceptions on packaging trends for the near-future and drivers for packaging innovation (interview question 5, appendix A), a recurrent theme was that ephemerality predominates. This ephemerality is related to the constant changes that the physical aspects of packaging undergo to respond to external influences. According to the literature on packaging design (Section 3.4), consumer demand is the biggest driver to change the configuration of packages managed by marketing departments. Trends such as convenience, single-serve, on-the-go, are common factors that marketers consider in making changes to the configuration of packaging in terms of materials or packaging format. It was determined here that the literature and interview data are consistent in portraying the food and beverage industry as driven by the change and speed in the dynamics of the market. The implication of this is that such change occurs at the package primary level as opposed to changing the broader packaging system. Such a restricted view on change is in conflict with long-term strategies to improve products in conjunction with packaging. The concept The next thing was developed to portray interviewees’ concerns about time, speed and change within the packaging industry. The concept More, not better was developed to portray interviewees’ concerns in relation to the social consequences of being driven by external pressures disassociated from the product-packaging system.

Following the above discussion, answer to research question [B1] is given here.

**How is the role of packaging defined and what factors influence the changing configurations of packaging?**

The current role of packaging is validated based on its Complexity and Invariability.

The varied tasks that were attributed to the role of packaging represent a departure from conceiving packaging only as fulfilling its ‘basic purposes’, and a move towards realising more intricate, complex expectations. The multi-purpose nature of packaging was a central argument for corroborating its significance and validating the relevance of its role. Concerns within the industry are intrinsically imbued with identifying the diverse isolated functions expected from packages, as opposed to taking on a more holistic approach, seeing the role of packaging as an integrated system. A transactional approach
consistently dominated interviewees’ perceptions of the role of packaging. These expectations were formulated for the most part from the perspectives of the trading context in which products are situated. Rather than being perceived as a supporting element for a product, packaging takes on a different connotation in which it is characterised as being a crucial factor for product success. The implication of the later is that little room is left for questioning the appropriateness or definitions of the role of packaging.

The emphasis shifted away from the elemental functions of the role of packaging in relation to protecting the product to a perceived merchandising character attributed to packaging as a way of validating its existence. An organisation-oriented approach prevailed, whereby the focus was placed upon what packaging can do for the organisation, principally in its ability to attract the consumer’s attention through the appearance of individual packages. The establishment of these expectations exposed an obvious link between organisations’ merchandising goals and interviewees’ objectives. The expectations of such a role were attributed subjectively: the emphasis was placed upon elements perceived as important, or the extent to which objectives are met through packaging. The explicit use of packaging to merchandise products, thus results in interviewees believing that many products would not be able to be sold without packaging.

Packaging as a concept needs to be reviewed; the current trade and distribution of food systems has to be challenged. The role of packaging needs to be simplified by reducing the number of tasks that it is expected to fulfil. A major implication of this point is that a fundamental reason for the existence of packaging, according to interviewees, was that the Complexity of the tasks performed by packaging justifies its use. As a result, definitional issues of the idea of packaging, as well as the distribution and trading system, go unquestioned and uncontested. However, one of the major issues of the current configuration of packaging is its Invariability. While issues with the operational/instrumental foundations of packaging for both design and industry are acknowledged by interviewees; there was an implicit resistance to change the theoretical foundation of packaging.

9.4 Research Question B2: Sustaining the unsustainable

When discussing issues of packaging sustainability, the views and perspectives that interviewees provided were varied. Some focused on environmental issues of the primary
packaging materials, that is, single packages; others were inclined to understand sustainability as a part of a system situated within a certain context. In the literature review, (see Chapter 2) issues of social justice and ethics were explored. In the food sustainability context, considering the relationship between production and consumption patterns, wherein food waste and food safety are major concerns, is particularly important. The adequate use of packaging in the current food distribution and trading systems has a role ensuring a certain standard of food safety and wastage. This clearly demonstrates the current indispensability of considering the relationship product-packaging before even posing questions of packaging sustainability. It seems clear from this, and from the interviews conducted for this research, that the AF&BPI is focused very much on the packages rather than packaging systems, which include the foodstuffs that need to be packaged. On the other hand, there is an embedded belief that the packaging industry is subject to disproportionate scrutiny compared to the relatively low impact that packaging accounts for in the food and beverage industry. A major argument remains the fact that packaging holds the function of protecting and preserving the product, preventing food loss and wastage, that as such it is a good outcome in terms of sustainability preventing food loss and wastage, ensuring a certain standard of food safety and wastage. However, it is also clear food and beverage packaging is still largely perceived as a marketing tool, and its success is thus defined by the degree to which it sells the product.

Answer to research question [B2] is given here.

How are perceptions of packaging success related to the notions of packaging sustainability?

The industry seems to be Sustaining the unsustainable: the role of packaging serves, for the most part, economic objectives on which packaging success is based on.

Interviewees were preoccupied with the idea of packaging sustainability as a barrier to realising their economic objectives, namely by designing packaging with reduced environmental impacts. To a lesser extent they are also concerned with improving existing packaging. Moreover, even with significant improvements across the various stages of the environmental life-cycle, the consumer trend for smaller packages and single serves might result in an overall growth in market volume; the result of this will be gross negative environmental impacts will continue to increase. Sustaining the unsustainable refers to the fixed condition and functioning of the food systems that do not allow for applying a holistic approach to packaging sustainability.

Section 9.3 discussed how the dynamics of the food and beverage industry are related to issues of speed and change. However, when interviewees discussed issues of packaging
sustainability, it appeared that their main concern was that change was not possible if there were no obvious or immediate economic benefits as a result of such change.

Some interviewees appeared to be involved in a cure-prevention struggle, that is, in a constant disjunctive between providing a ‘remedy’ to what they perceived as the issue with packaging sustainability, and taking a more ‘preventive’ approach. However, there was a clear tendency to predefined the issue of packaging sustainability as a problem of material choices and their consequences.

Packaging sustainability and the reference to temporality is essential since the two are intrinsically related. Some interviewees presented sceptical positions which argued the suitability of the term’s definitional function, due to the ambiguous-complex duality of the issues that surround it. While there was recognition of the existence of certain preferable factors and qualities in relation to sustainability, these were regarded as relative, in a state of constant change and often unpredictable. Another struggle that interviewees faced in defining sustainability was the almost ‘idealistic’, absolute and fixed connotation that the term carries and which, in turn, is perceived as ‘intangible’ or unattainable. The concept The intangible was thus generated out of the responses that illustrate the way these concerns were articulated.

To design ‘environmentally improved’ versions of existing packaging was acknowledged as conceptually different from design for packaging sustainability. It cannot be assumed that the functions that packaging performs will be continually resolved through packaging in its current configuration. Rather than create greener versions of existing packaging that simply add to consumer choice, some interviewees recognised that the trend should be towards the elimination of packaging, and that this is what will advance the discourse of packaging sustainability. Clearly such elimination requires a radical way of thinking about the current food systems and its distribution. However, this shift can be identified as totally counter to what interviewees believe about the existence of packaging. For the elimination of packaging to actually occur, those involved in design practices of the food and beverage packaging industry need to take the issue of sustainability seriously and actually stop creating more, as opposed to merely reducing it. Packaging sustainability is therefore closely related to strategies for making the physical configuration of packaging ‘more environmentally’ benign and there is a belief that such a transformation can be quantified, in terms of how sustainable or not packaging is.

Packaging sustainability must take many different factors into consideration. The focus should not be put on materials as a definitional factor, as material choices might be made
in terms of the product to be packaged. Then, it seems that materials should be defined according to how a packaging solution is configured, meaning that it is a definitional issue. A major issue to be considered is that defining the need ‘appropriately’ will play a significant role in the ‘achievement’ of sustainability criteria, and this is something that is done via the design brief. What this means is, it is important to consider whether that which has been decided or designed is actually the most ‘appropriate’ way of fulfilling the real need; this is the role that packaging is meant to perform, and which, paradoxically, does not necessarily have to be fulfilled by the packaging. However, there are different angles from which sustainability can be approached: having a ‘recipe’ to follow might overlook the specific contexts and objectives of a product; this might result in contradictions between the product’s own objectives and those which are ‘prescribed’. Therefore, this ‘recipe’ could, and should, undergo adjustments in each individual case; the difficulty would then be to measure and balance priorities and perspectives.

9.5 Research Question C: Option or Necessity

Throughout history, the role of design has been contested. Papanek asked for a revision of current design practices over 40 years ago. Now more than ever before, organisations within the AF&BPI need urgently to acknowledge their responsibility for the results of their practices in the context of sustainability. The intrinsic focus that has in recent times been placed upon addressing isolated environmental issues, particularly those at the end-of-life waste management of materials, needs to shift towards radically influencing production and consumption patterns. Design practice needs to be understood in a more holistic way not only by organisations but also by design partitioners themselves, to significantly engage with the social and ethical issues inherent to sustainability.

Answer to research question [C] is given here.

How is the structure of the AF&BPI influencing the setting and realisation of packaging sustainability?
The industry seems to struggle to understand sustainability as Option or Necessity.

The current role of food packaging is undoubtedly subordinated to the fact that food has become a commodity; following this, packaging has itself evolved to into an industry. In examining packaging in the context of the food industry, it is important to consider production, distribution and merchandising goals, as these directly influence the need for and configuration of packaging. One major issue is that the trading scheme within the packaging industry is principally dominated by retailers, such as supermarkets. These
organisations have a strong influence in determining the very existence of packaging, as well as its configuration.

A consistent connection between the product and the packaging is therefore an essential consideration in terms of sustainability, as the existence of packaging should always be subordinated to the existence of a product. In reality however, marketing goals are the dominant drivers over other aspects of packaging; they rely heavily on it for product success in commercial terms, as opposed to relying on the product’s attributes. This can be taken further, to the extent that sustainability issues are considered as driven, in most cases, by financial or marketing objectives as opposed to being used as a resource for informing the relationship between the product to be packed and the design of such packaging.

Those involved in design practices are therefore trapped between the imposed isolated marketing goals and their own knowledge about how the end product could be improved in more holistic terms. Those who participate in the design of packaging thus hold back their own knowledge so it is possible to accommodate the objectives of the industry, whether in terms of their own organisation or more broadly. Likewise, organisations operate on similar assumptions. While they are aware of sustainability issues and intrinsically generate ideas as to how these issues could be addressed (via the abovementioned individuals who hold back their knowledge), organisations also operate on the assumption that marketing is the factor which essentially overrides all other concerns. Thus, consideration of the sustainability issues of packaging is dismissed on grounds of marketability, even though a more holistic view could achieve improvements on many of the other aspects of packaging. While there is recognition of the importance of considering issues of packaging sustainability, and while organisations within this industry are well-equipped with the required information and tools to actualise sustainability, those involved in design practices have found themselves involved in the struggle between the imposed and the ideal. That is, it is recognised that sustainability is necessary; however it is believed to be negotiable where it creates perceived conflicts with the overarching goal of the marketing of the product. Sustainability in packaging is thus often considered in terms of option over necessity: none of the awareness or knowledge around sustainability proves sufficient to overcome the focus on marketing.

These views can be compared and contrasted against interviewees’ characterisations on the role of packaging (Section 6.1); notions on packaging sustainability (Section 7.1); and elements regarded as important for packaging success (Section 7.3). Then, it is possible to recognise interviewees’ actual concerns by distinguishing any correspondences,
discrepancies or omissions between what they say that a package is meant to do; what they understand packaging sustainability could be; and what the final packaging outcome is (Figure 9.3).

![Figure 9.3 Relationship between conditions, aspirations and outcomes in packaging](image)

Design that is intended to contribute to sustainability, however, needs to be understood beyond merely addressing environmental issues. It needs to have an active role from the initial planning of that being designed, considering all possible consequences in society. There is a widespread recognition that trade-offs between all aspects have to be made in packaging design. Furthermore, the way these decisions are made is influenced by the beliefs of those involved in such decision-making processes.

Having reviewed concepts and different approaches to design from an environmental and sustainability point of view, there are four key points for this research:

1. Design approaches that aim to consider the environmental aspects of products frequently have a prescriptive character since they are concerned with the technical aspects of products; the role of design is then limited, because it is primarily regarded in terms of the improvement of the technical issues of products wherein specific measures or actions are to be followed.

2. Due to their prescriptive character, these approaches can be seen as part of the problem as it currently exists, rather than as an alternative for change. Specifically, they may reinforce the idea of the ‘need’ of a product, with no consideration of the complexities and interdependencies of proposed solutions, including the social and ethical implications of the existence of such...
products. Therefore, the design practitioner lacks opportunities for challenging the conceptual basis of a product.

3. In the prescriptive character of these design strategies there is an inherent assumption of an individual context of practice in which the designer has the power to make critical design decisions; the implication of this is that it fundamentally disregards other contexts of practice, i.e. practices within the industry context in which the need for a product is typically defined by a client or by an internal request.

4. Finally, the understanding that design for sustainability encompasses more than eco-design principles becomes fundamental. There seems to be a consensus among those involved in design practices that notions of design need to be redefined, acknowledging the specific contexts of its practice, and that design needs to have a role in sustainability.

This comparison assists in elucidating compromises and trade-offs made in decision-making processes; more importantly, these propositions can elaborate on the changes that need to occur, in both the role of packaging and packaging industry practices in order for packaging sustainability to be actualised.

9.6 Research Question D: **Lost in translation**

In terms of addressing the transitions required for packaging sustainability, it first becomes imperative to question in a more meaningful way the very idea of the creation of a ‘single-use’ or short-lived packaging product. Thus, the motives and practices within organisations and within the whole industry must be questioned.

Answer to research question [D] **What transitions are required for packaging sustainability?** is given here.

There is a narrow focus as to what the actual issues in relation to packaging sustainability are, and how the industry needs to change in order to actualise packaging sustainability. When those involved in design practices discussed their understandings of packaging sustainability, descriptions were limited and constricted, associating it exclusively with the environmental issues related to materials. Therefore, the ways of resolving or addressing such concerns primarily focused on issues of the physical configuration of packaging, particularly in terms of material selection and recyclability. A main challenge for the
industry, then, is to broaden its focus to encompass the extensive and intangibility of packaging sustainability and overcoming the general obsession for quantifying and measuring the achievement and performance of their efforts.

Furthermore, packaging sustainability is to be actualised through rethinking the roles that packaging is expected to fulfil, as opposed to focusing on new ways of doing the same thing based on the same assumptions. Packaging sustainability as a whole is unmeasurable, since every situation is different: different types of products have different constraints, complexities and challenges. The implications of this are that radical changes for sustainability are unlikely to actualise if practices and ways of operating remain unchanged. Organisations, though, tend to assume that addressing issues of sustainability is an option rather than a necessity. A consistent belief prevails that regulations as well as external scrutiny are the main drivers for them to engage, in a more structured way, in issues of packaging sustainability. That is, unless the fear-factor is imposed onto them, they believe that the consideration of packaging sustainability is a matter of choice. A different approach to decision-making and the manner, in which this interacts with other factors such as the availability of information or the financial incentives facing individuals, needs to be taken to drive behaviour towards packaging sustainability.

In the instances in which strategies or initiatives towards packaging sustainability are in place within organisations, a main constraint in actualising these happened to be the internal structure and dynamics of organisations, otherwise described as what the process is and how the information flows. That is, interviewees identified missing links throughout the communication processes of those organisations within which strategies for change in sustainability exist.

9.7 Contribution to knowledge
Research Question E: Awareness and Intentionality in packaging design practice

The aim of this section is to provide a framework with the recommendations for the essential transformations required in both design practices and the packaging industry context to actualise the role of design for sustainability. This framework embodies the contribution to knowledge of this investigation.

Figure 9.4 summarises the answers of each of the research questions, through the concepts and propositions developed.
The current discussion provides answers to the ultimate research question of this investigation:

**[E] How might transitions be realised so that design effectively actualises its role in sustainability?**

The practice of design has to move in the direction of Awareness and Intentionality.

Since this investigation is concerned with design practices as they exist, it is necessary to understand how the social reality of those involved in such practices fits into a larger ontology. That is, by understanding how such a reality relates to the broader context, it is possible to identify the transitions necessary for the role of design for sustainability to be articulated.

It has been established that a major constraint for design to actualise its role in packaging sustainability is the setup of the industry. This configuration in many cases leads to a very specialised and segmented practice of design, adding complexity to it; the interaction between all the parts might be one of opposition in terms of how the design situation they are dealing with is defined and what the best possible ways to approach it are. By having this specialisation of design, its practice becomes isolated: this, in many cases, results in conflicts between the many objectives, making it difficult to achieve a common goal. A particularly important issue here is the level of awareness that practitioners might or might
not have of their practice and, even more importantly, what the consequences of each scenario might be. In Chapter 2, Schön’s work on reflective practice was discussed, elucidating the concepts of ‘frame analysis’ which relates to the ways professionals frame a given problem and, therefore, their roles. Schön emphasised that practitioners set their roles in various contexts; yet if they are unaware of the frame of their roles or problems, then the need to choose from among them is inexistent as it is a given reality for them. Furthermore, he established that the ‘frame analysis’ concept might help practitioners to become aware of their ‘tacit frames’, which in turn would help them to become aware of the variety of frames available to them, ultimately leading them to see the need to ‘reflect-in-action’. While Schön’s concepts are not specifically attached to the particular practice of design, they became useful to this research when issues of awareness emerged in the data collected in interviews. This data was compared in a systematic way and new concepts grounded in the data emerged.

The name Frames of reference used here refers to the variety and diversity of frames that practitioners can adopt, and which Schön fails to explain. To avoid confusion, it seems important to clarify that the concepts generated in this Ph.D. investigation were named in parallel to those of Schön. The reason for it is that they build and expand on notions of awareness as a key for change, in this case, in the professional practice of design. Awareness is an important element in the classification of the three Frames of reference. A major discrepancy from Schön’s ‘frame analysis’ concept is that his version fails to explain at a conceptual level how the intricacies of the situation influence and become the reference for practitioners to ‘frame’ their role and, as a consequence, how they define their problem. It also explains that once a practitioner becomes aware of other possible frames, such awareness is the ultimate catalyst to explore and engage with them. Frames of reference provides a general classification of the characterisations of the roles, responsibilities and interactions among those involved in design practices, which might vary with the situation and context of practice. Furthermore, Frames of reference depicts the various situations that one might find in their practice of design, considering the complexities of the context and the interactions with others; ways of dealing with the situation are also subordinated to such complexities.

Earlier in this section, it was noted that a major constraint for design for sustainability was the setup of the industry; this makes it difficult for design to be a multidisciplinary practice where all parts of a design situation are involved in the definition of the design problem and facilitate the achievement of a common objective. A design practice that is meant to contribute to sustainability is the result of informed and reflected planning and decision-making processes in which arriving at ‘the right solution’ is not the ultimate aim, but rather
the balance of diverse perspectives that have the conscious intention to transform a situation into a more appropriate one. **Figure 9.5** illustrates how the *Frames of Reference* proposition builds upon the existing design paradigms:

![Figure 9.5 Evolution of design paradigms](image)

*Adapted from: Dorst and Dijkhuis 1995*

The direction in which design practitioners and organisations must move towards a more **versatile Frame of reference**. This will allow for occupying a position in which negotiation on how a situation is articulated and addressed can be clarified. Reasons for the need for this shift have their roots in various issues, including the way design is currently being conceived; hierarchical structure within organisations; the way designers understand their own practice; and a sense of understanding one’s role but contradicting it in practice. The emphasis thus switches from ‘what interviewees do’ to ‘what needs to be done for actualising the role of design in packaging sustainability’. *Frames of reference* explains how the social reality of those involved in design practices is created by them and seems readily intelligible to them as it fits their purposes.

### 9.8 Research limitations

The limitations of the research are related to a number of issues, which emerged throughout the investigation process, and which are detailed below.

1) There is an acknowledgement that the concepts and propositions from this research are based on existing notions of design within the specific context of the AF&BPI. Then, in order to understand how the *Frames of reference* proposition is relevant to other research areas, it is necessary to explain factors that influence the
way those involved in practices construct and sustain their 'reality'. The main concerns in this are awareness and intentionality.

2) Since the proposed framework was generated from a particular context, namely the packaging industry, it is necessary to corroborate if the proposed framework can be applied to a general context, that is, design for sustainability in other industry sectors. This is a central issue in design.

3) This investigation was concerned with reviewing design practices to understand the situation as it is, as opposed to engaging on issues of organisational management theory.

4) The objectives of this investigation go beyond establishing what packaging sustainability is; therefore the focus was neither on the physical configuration of packaging nor on materials.

5) The research sought to distinguish dependencies on contingent variables within design practices, and concepts grounded in the data were generated to then develop a general theory of design for sustainability.

6) In GT, the number of relevant people or incidents is determined by ‘theoretical sampling’, in which the focus and importance is placed on the data gathered rather than on the number of interviewees.
9.9 Implications of the research propositions for policy

The most relevant policy regarding packaging sustainability currently in place in Australia is the Australian National Covenant, as discussed in Section 1.1. The Covenant which is a major voluntary initiative, has set its commitments in relation to promoting the sustainable manufacture, use, and recovery of packaging. The main objective of the APC is to reduce the environmental impacts of consumer packaging. While the APC has set up three main strategies to achieve its objectives through design, recycling and product stewardship; the Covenant’s success is evaluated by measuring performance against all three goals. A major issue is that while the strategies do consider important aspects of the life-cycle of packaging materials and while the Sustainable Packaging Guidelines provided in the new APC propose change throughout the industry through design, it seems that the focus remains on primary packaging.

As reviewed in the literature (Section 2.5), design that is intended for sustainability needs to be fully aware of the issues of the context of practice to be able to create change. This research calls for change in business practices as well as the practice of design. According to those interviewees in the versatile Frame of reference (Section 5.3.3), the role of design practice in packaging sustainability goes beyond issues of the physical aspects of packaging or issues of related to its manufacturing. Challenging the very conceptual foundation of the packaging industry and how contemporary food systems operate is a big issue in terms of regulation. The debate should thus be moving away from policy that focuses on issues related to the lower levels of packaging systems, i.e., primary packaging.

9.10 Further research work

One major contribution of this body of research is the use of the Grounded Theory method to collect and analyse data to investigate the reality of design practice, without looking at the design activity as such, and without limiting the approach to design professionals. Then, the concepts generated are applicable a real situations of design practice. While this research was generated from a particular area of design, i.e., packaging design practices, according to the GT method the concepts and propositions should be readily available to application in the general or broader context of design practice. Directions for further research are detailed as follows:
1) Applying the *Frames of reference* propositions in the current context of the AF&BPI for validation. The data collection and analysis was undertaken before the recent version of the APC was released, and other issues in the sustainability discourse have since evolved. The availability of resources to assist organisations in strategies to improve their practices in terms of sustainability has also increased.

2) Applying the concepts generated out of this research to a case study by choosing a specific organisation and identifying the roles of those involved in design decisions and practices.

3) Applying the *Frames of reference* propositions to another area of design for testing and validation. Concepts could be modifiable if the context of uses requires such modifiability.

4) Applying the *Frame of reference propositions* to another area of practice in the area of sustainability.

5) Applying GT method, as it was used and adapted to this particular research, to investigate another unrelated area in which issues of awareness and intentionality are essential elements of their practice.

6) The framework *Frames of Reference* offers an alternative to mainstream design practices, bringing significance to both sides of a long-standing disagreement between the theory and practice of design. It also offers a new vision through which to approach design practices, one where Awareness and Intentionality, either conscious or unconscious, are fundamental aspects of the ontology of design practices, and one that challenges basic elements underpinning its existence and often in conflict with or in contradiction to notions of sustainability.
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Available:


appendix A: Interview schedule

The following interview schedule was used as a topic guide for interviews. The order and wording was used and adapted as necessary/appropriate.

1. Interviewee’s perceptions on their own role and responsibilities.

2. Interviewee’s involvement in design decisions, both directly and indirectly.

3. Interviewee’s interactions with others involved in design practices.

4. Interviewee’s perceptions on the current role of packaging.

5. Interviewee’s perceptions on drivers for packaging innovation and on trends for the near future.

6. From interviewee’s perspective (specifically related to their role), what constitutes a successful packaging proposition?

7. Interviewee’s understanding of ‘sustainable packaging’ or ‘packaging sustainability’.

8. From interviewee’s perspective, drivers to encourage organisations to engage with issues of packaging sustainability.

9. Interviewee’s rank of the environment in their decision-making processes.

10. Type of information or tools used/needed by interviewee to make decisions in regards to sustainability issues.

11. Interviewee’s perceptions on challenges faced by the Australian Food and Beverage Packaging Industry towards packaging sustainability.
appendix B: Ethics Approval Application

2006
Application for ethics approval of research involving human participants

Section A: Approvals and declarations

1. Project Title: Investigating the Role of Design in the Development of Sustainable Packaging Systems

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<tr>
<td>Name: Areli Geraldine Avendano Franco</td>
<td>Name:</td>
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<tr>
<td>Student No: S3122855</td>
<td>Qualifications:</td>
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<tr>
<td>Qualifications: B. Industrial designer; B. in Dsn (Hons) Masters in Industrial Design; M. in Dsn</td>
<td>School:</td>
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<tr>
<td>School: Architecture and Design Centre for Design</td>
<td>Phone:</td>
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<td>Address: 9/14 The Avenue, Windsor 3181 VIC</td>
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<td>Phone: 0423639154</td>
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<tr>
<td>Degree for which Research is undertaken: PhD in Industrial Design</td>
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<tr>
<th>Senior Supervisor</th>
<th>Other investigator/s</th>
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<tbody>
<tr>
<td>Name: Dr. Karli Verghese</td>
<td>Name/s:</td>
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<tr>
<td>Qualifications: B. Applied Science; BSci (Hons), PhD</td>
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<tr>
<td>School: Architecture and Design Centre for Design</td>
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<tr>
<td>Phone: 9639 3412</td>
<td>Phone:</td>
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<tr>
<td>Email: <a href="mailto:Karli.Verghese@rmit.edu.au">Karli.Verghese@rmit.edu.au</a></td>
<td>Email:</td>
</tr>
</tbody>
</table>
2. Declaration by the investigator(s)

I/We, the undersigned, accept responsibility for the ethical conduct of the research detailed below.

Signed: ___________________________ Date: ___________________________
(Signature of investigator)

Signed: ___________________________ Date: ___________________________
(Signature of senior supervisor if applicable)

3. Declaration by the Head of School/Centre

The research project set out in the attached application, including the adequacy of its research design and compliance with recognised ethical standards, has the approval of the School/Portfolio. I certify that I am prepared to have this project undertaken in my School/Centre/Unit.

Signed: ___________________________ Date: ___________________________
(Signature of Head of School or approved delegate)

Comments:

School/Centre: _______________ Extn: _______________

Section B: Project particulars

1. Title of Project

INVESTIGATING THE ROLE OF DESIGN IN THE DEVELOPMENT OF SUSTAINABLE PACKAGING SYSTEMS

3. Project description: for HREC assessment of ethical issues

4. Aims and Significance

The PhD research is set within the Food and Beverage Packaging Industry (which constitutes 65-70% of the total packaging produced in the Australian packaging industry (PCA 2001)). Packaging plays a fundamental role in our modern society as it is the means of protection, distribution, delivery and presentation of products (Denison and Ren 2001). Packaging is also a strategic tool for product positioning in the marketplace and packaging designers must be able to develop cost-effective packaging that is in balance with the requirements of each segment of the supply chain.

In 1999 the National Packaging Covenant (NPC) was first introduced as a voluntary agreement between all levels of government in Australia and the packaging industry to address the environmental impact of consumer packaging. One of the strategies proposed by the NPC to address such issues is through improved product design process - which requires the consideration of decisions made on selecting materials, material efficiency, manufacturing as well as end-of-life management during the development of the packaging. Designing a packaging system that effectively meets essential functional and business requirements from both the product system and the environment should be an integrated element in the total product design process. It is widely recognised that it is important to include this type of decision making early in the product development when packaging designers in coordination with other professionals (marketers, environmental managers, supply chain managers, manufactures, retailers, etc) have the greatest opportunity
to address environmental pressures and as a result develop effective sustainable packaging systems (Lewis and Gertsakis 2001).

The PhD research aims to investigate the processes involved in the design and development of packaging system strategies throughout the supply chain to identify the gaps and limitations in the decision-making processes currently used within organisations. The roles and responsibilities of each stakeholder (e.g., packaging technologists, environmental managers, procurement, marketing) and the barriers and trade-offs made will be reviewed and assessed. This will allow for the identification and recommendations of the opportunities for design to effectively meet business and marketing requirements as well as integrate sustainable principles early within the new product-packaging development process. In addition to effectively combining economic and environmental requirements, a sustainable packaging system is also required to meet social values. Therefore, the research will also involve the observation and exploration of consumers’ demands, concerns and practices towards packaging systems to benchmark attitudes already proposed and integrate them into the above decision making process. The anticipated outcome of the research is the refinement of a framework for those in the product-packaging development process to use as an integral tool in the development of sustainable packaging systems. It is also envisaged (pending available time) that the developed framework will be applied to an actual packaging project to assess its performance and robustness.

The research questions are:
1. What are the relationships and influences within the packaging supply chain stakeholders and what are the implications (opportunities/barriers) for the packaging development process?
2. How can the development process of packaging systems be enhanced / influenced to concurrently address business drivers, consumer demands and environmental pressures?
3. What is the role of design in influencing production and consumption practices towards sustainable packaging systems?

- Proposed methodology

The first stage of the research involves the gathering of qualitative data through the review of the literature; the review of current packaging systems; formal interviews with packaging supply chain stakeholders; site-visits (observational research); and conducting participant observation (focus groups). A visual diary will also be used to record observations, thoughts and questions as they occur as well as to assist the research in the visual record. The final stage of the research will involve a design project as a case study to “road-test” the appropriateness and usefulness of the developed framework.

- The research methods

Interviews will be used to collect the necessary data in order to answer the research questions.

a) Interviews
Face to face interviews with marketing executives, designers, packaging technologists, supply chain managers, manufacturers, environmental managers, retailers and government are proposed. The interviews will be used to collect information on the current issues in the packaging industry and identify opportunities and barriers for the development of sustainable packaging systems. The interviews will involve a semi-structured questionnaire.

The topics for the interviews will be:
1. Role of packaging
2. Packaging supply chain requirements and communication processes
3. Packaging design processes
4. Business drivers, marketing, environment regulations and consumer demand
5. Methods and tools currently used in packaging design
6. Business vision of packaging and sustainability
7. Opportunities and barriers for integration of sustainable principles in the design process of packaging systems
8. Retailer requirements and drivers for packaging innovation
**What participants will be required to do**

In the interviews, people will be expected to undertake a questionnaire with ±10 semi-structured questions which should not take more than 1 hour to complete. The interviewees are also expected to give written permission for tape-recording the interview to facilitate the transcription of results. For the site visits, the participants are expected to conduct a tour around the facilities and give information of the requirements and conditions for the manufacturing of packaging materials as well as for their recovery.

References:

4. **Research funding**

This PhD Research in Industrial Design at RMIT University (Centre for Design) is funded by The National Council for Science and Technology of Mexico, through a 36 month scholarship. The scholarship has the purpose of encouraging and supporting overseas professional development for Mexican students in the fields of science and technology. The research project is freely chosen by the investigator and does not necessarily have to be situated in the Mexican context. However, the research results are expected to contribute significantly to the field of study and to potentially be used in Mexico.

Section C: Details of participants

1. **Number, type, age range, and any special characteristics of participants**

   a) **Interviews:**

   **Number of potential participants:** defined by theoretical sampling

   **Characteristics of participants:** People from a different range of professional skills within five major sectors involved in the Food Packaging Industry:
   1. Packaging brand-owners: Marketers, designers, supply chain managers, environmental managers, packaging engineers and technologists, distribution and logistics managers
   2. Material suppliers and packaging manufacturers
   3. Retailers (supermarkets)
   4. End-of-life management facilities
   5. Government representatives

2. **Source of participants**

   Most of the potential participants for the interviews and site visits have been selected from my industry network built up from attending relevant conferences, packaging functions, roundtables at the Sustainable Packaging Alliance, etc; some other potential participants will be selected from the National Packaging Covenant Signatories List available on-line from the Australian Packaging Council (http://www.packcoun.com.au/covtsign1.html).

   The participation for focus groups will be open to the general public as it is intended to get a real insight of consumers’ needs and concerns regarding packaging systems.

3. **Means by which participants are to be recruited**

   I directly will be the one responsible for recruiting all participants for interviews, site visits and focus groups. For interviews it is intended to contact around 50 potential participants. Potential interviewees will be contacted via telephone to gauge their level of interest in participating and will receive a formal letter (sent via email) requesting their involvement in the interviews. Once a positive response is obtained, a formal meeting will be arranged.
4. Are any of the participants ‘vulnerable’ or in a dependent relationship with any of the investigators, particularly those involved in recruiting for or conducting the project?

No.

**Section D: Estimation of potential risk to participants and project classification**

1. Please identify the project classification by assessing the level of risk to participants

   Risk Level 1.

2. If you believe the project should be classified category ‘Risk level 1’ or category ‘Risk level 2’ please explain why you believe there are no risks or minimal to the participants.

   While the project involves interviewing a normal adult population where a small set of personal data from participants will be collected, they will not be exposed to any physical, psychological or social risk above the everyday norm. For interviews, participants’ names and their organisation will be collected but will not be published and it will be replaced by a code in the transcriptions to guarantee participants’ privacy. Only the researcher will have access to the recorded interviews and their transcriptions. For the focus groups, only the age range group will be collected as a reference for assessing results, other than that no other personal details will be asked.

   A list of general topics/questions for interviews will be given to potential participants in written form, if requested, and prior agreement of participation will be gained. In this way, potential participants have the opportunity to make an informed decision whether they are willing to participate or not, as well as reflect on and discuss any issue that might conflict / concern them with the researcher in advance.

   Potential questions for interviews:

   1. Packaging Industry: What is currently driving change/innovation in the packaging industry? What are the objectives, principles, strategies and approaches pursued in the development of new packaging systems? What is the hierarchy of requirements in the packaging development process?
   2. Packaging development process: What is your role and what are the aspects of the process that you are dealing with? How would you describe the packaging development process that you follow? Where could improvements be made?
   3. Packaging issues: What is the current role of packaging? What are the values, benefits and attributes in the packaging solutions pursued by the company?
   4. Sustainable Packaging Design: Is the company addressing any environmental issue related to the manufacturing, production or consumption of packaging materials? If no, why? If yes, what are the measures taken?
   5. Design Issues: What are the implications for the company of the implementation of sustainable principles in the development process of packaging systems? Are you using any existing sustainable design tool to assist the development process? Why? What are the strengths and the weaknesses in the application of the tool?
   6. Business issues: What are the business drivers in the packaging industry? How is it possible to create a business opportunity for the development of sustainable packaging systems?
   7. The National Packaging Covenant: What implications exist for the development process of packaging systems in the company? How is it being implemented? What are the most common constraints for compliance?
   8. Consumer issues: What are the processes used to incorporate the consumer’s demands and concerns in packaging solutions? How is it possible to create an effective communication with the consumer about the packaging features/values?

3. Please detail any other ethical issues which may be particularly associated with this project.
Interviews conducted will be tape-recorded:
If participants consent the interview to be recorded for transcription; some measures will be taken to assure confidentiality, as follows:

a) Participant’s name and organisation will be removed from the transcriptions and will be replaced by a code that only the researcher will be able to identify.
b) No names or any other personal information will be mentioned in the interviews to ensure that people cannot be identified by name.
c) The tapes and hard copies of transcriptions of the interviews will be kept in a locked cabinet at my house which no-one will be able to access.
d) The digital version (word documents) of the transcriptions will be stored on my personal drive in the university network as well as on my laptop; I am the only person that can access them. As a security measure, a back-up of the transcriptions will be made and will be stored in the same locked cabinet at my house.
e) Hard copies of transcripts as well as the tapes with the interviews will be kept for a period of 5 years in secured storage and then they will be destroyed. The digital files will be removed from my personal drive in the university network as well as my laptop at completion of the degree.
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<td>a) Does the data collection process involve access to confidential data without the prior consent of participants?</td>
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<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td>b) Will participants have pictures taken of them eg, photographs or videos?</td>
<td></td>
<td>X</td>
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<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td>c) If interviews are to be conducted will they be tape-recorded? <strong>NB</strong> if interviews are being conducted please attach a list of proposed interview questions/themes to this application.</td>
<td></td>
<td>X</td>
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<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
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<tr>
<td>d) Are the participants in a dependent relationship with the investigator/s?</td>
<td></td>
<td>X</td>
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<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td>e) Is deception to be used?</td>
<td></td>
<td>X</td>
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<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
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<tr>
<td>f) Do you plan to use an interpreter?</td>
<td></td>
<td>X</td>
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<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td>g) Does the research involve any tasks or processes which participants may experience as stressful or unpleasant during or after the data collection?</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
<tr>
<td>i) Are there in your opinion any other ethical issues involved in the research eg is it possible that you will be collecting/disclosing information about a third party not involved in the research?</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>If ‘Yes’ please give details of any actions you will take to ensure that participants are not compromised by this:</td>
<td></td>
</tr>
</tbody>
</table>
Section E: Informed consent

1. Attach to your application

(a) a copy of the letter to participants providing plain language information about the research. This will often be the letter inviting people’s participation. This should normally be on RMIT letterhead.

(b) a copy of the Consent form for research participants. If you are not obtaining consent in writing please explain why.

2. Dissemination of results

Participants should be informed that results from the study may appear in publications. This information is to be included in the information given in the Plain Language Statement prior to obtaining informed consent.

Section F: Research Involving Collection, Use Or Disclosure Of Information

1 Does this Section have to be completed?

Does the project involve the collection, use or disclosure of personal information (includes names and contact details), health information including genetic information, or sensitive information?

☐ No – you do not have to answer any questions in this section. Go to Section G.

☒ Yes – you must answer questions in this section. Go to Question F2.

2 Type of activity proposed

Are you seeking approval from this HRESC for:

(a) collection of information?

☒ Yes – start at Question F3

☐ No – start at Question F4

(b) use of information?

☒ Yes ☐ No

(c) disclosure of information?

☐ Yes ☒ No

3 Collection of Information

(a) Does the project involve collection of information directly from individuals about themselves?

☐ No – (ie -collected from a third party/existing records) You must fill out the Special Privacy Form (download from the Web from URL) as well as this form.

☒ Yes – answer the following questions:

(b) What type of information will be collected? (Tick as many as apply)

☒ personal information (eg name, contact details etc)

☐ sensitive information (eg affiliations, income values, attitudes etc)

☐ health information

(c) Does the plain language statement explain the following?
Use or Disclosure of Information About Individuals

(a) Does the project involve the use or disclosure of identified or potentially identifiable information?

☑ Yes – answer the following questions.

☐ No – go to Question F5.

(b) Does the project involve use or disclosure of information without the consent of the individual whose information it is?

☐ No – go to Question F5.

☑ Yes, You must fill out the Special Privacy Form, as well as this form. (download from the Web from URL)

General Issues

(a) How many records will be collected, used or disclosed? Specify the information that will be collected, used or disclosed (e.g. date of birth, medical history, number of convictions, etc)

<table>
<thead>
<tr>
<th>Number of records:</th>
<th>Type of information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>For interviews: ± 30</td>
<td>For interviews: Participant’s name and organisation.</td>
</tr>
</tbody>
</table>

(b) For what period of time will the information be retained? How will the information be disposed of at the end of this period?

Hard copies of transcripts as well as the tapes with the interviews will be kept for a period of 5 years in secured storage. The digital files will be removed from my personal drive in the university network as well as my laptop at completion of the degree. Hard copies of transcripts and the tapes will be destroyed.
(c) Describe the security arrangements for storage of the information. Where will the information be stored? Who will have access to the information?

The tapes and hard copies of transcriptions of the interviews will be kept in a locked cabinet at my house which no-one will be able to access. The digital version (word documents) of the transcriptions will be stored on my personal drive in the university network as well as on my laptop; I am the only person that can access them. As a security measure, a back-up of the transcriptions will be made and will be stored in the same locked cabinet at my house.

(d) How will the privacy of individuals be respected in any publication arising from this project?

Interview participants’ names and organisations will be collected just as a reference for the researcher. In case of publication of results, participants’ opinions will be referred to by the sector of the industry they belong to (e.g. Packaging Manufacturer, Retailer, etc.); no names of any organisation will be mentioned either.

(e) Does the project involve trans-border (i.e. interstate or overseas) data flow?

☐ Yes  ☒ No

If Yes, give details of how this will be carried out in accordance with relevant Privacy Principles (e.g. HPP 9, VIPP 9 or NPP 9).

(f) Does the project involve the adoption of unique identifiers assigned to individuals by other agencies or organisations?

☐ Yes  ☒ No

If yes, give details of how this will be carried out in accordance with relevant Privacy Principles (e.g. HPP 7, VIPP 7 or NPP 7).

6 Adverse Events

Are procedures in place to manage, monitor and report adverse and/or unforeseen events relating to the collection, use or disclosure of information?

☐ Yes  ☒ No

7 Other Ethical Issues

Section G: Other issues

1. Do you propose to pay participants? If so, how much and for what purpose?

No.

2. Where will the project be conducted?

The interviews and site visits will take place at participants’ work place. However, in the case of the interviews, where advised by the participant, they might take a pre-defined alternative place (restaurant, café, etc.). For the focus groups, the location is still to be defined; a potential venue will be the Centre for Design at RMIT where I am doing my research (appropriate written permission will be obtained).
3. Is this project being submitted to another human research ethics committee, or has it been previously submitted to a human research ethics committee?

No.
Appendix C: Informed Consent Form

RMIT Human Research Ethics Committee

Prescribed Consent Form for Persons Participating in Research Projects Involving Interviews, Questionnaires, Focus Groups or Disclosure of Personal Information

Portfolio of School/Centre of Architecture and Design (Centre for Design)

Name of participant: 
Project Title: Investigating the Role of Design in the Development of Sustainable Packaging Systems

Name(s) of Investigators:
(1) Areli Avendano Phone: 0423639154
(2) 

1. I have received a statement explaining the interview/questionnaire involved in this project.
2. I consent to participate in the above project, the particulars of which - including details of the interviews or questionnaires - have been explained to me.
3. I authorise the investigator to interview me or administer a questionnaire.
4. I give my permission to be audio taped [ ] Yes [ ] No
5. I give my permission for my name or identity to be used [ ] Yes [ ] No
6. I acknowledge that:
   (a) Having read the Plain Language Statement, I agree to the general purpose, methods and demands of the study.
   (b) I have been informed that I am free to withdraw from the project at any time and to withdraw any unprocessed data previously supplied.
   (c) The project is for the purpose of research and/or teaching. It may not be of direct benefit to me.
   (d) The privacy of the information I provide will be safeguarded. However, should information of a private nature need to be disclosed for moral, clinical or legal reasons, I will be given an opportunity to negotiate the terms of this disclosure.
   (e) The security of the research data is assured during and after completion of the study. The data collected during the study may be published, and a report of the project outcomes will be provided to Dr. Karli Verghese (senior supervisor). Any information which may be used to identify me will not be used unless I have given my permission (see point 5).

Participant’s Consent

Name: ___________________________ Date: ___________________________

(Participant)

Name: ___________________________ Date: ___________________________

(Witness to signature)

Any complaints about your participation in this project may be directed to the Secretary, RMIT Human Research Ethics Committee, University Secretariat, RMIT, GPO Box 2476V, Melbourne, 3001. The telephone number is (03) 9925 1745.
Details of the complaints procedure are available from: www.rmit.edu.au/council/hrec
Plain Language Statement to be used in a research project involving human participation for INTERVIEWS.

Dear …………………

My name is Areli Avendano. I am undertaking a PhD program in Industrial Design at RMIT University (Centre for Design). The title of my research is Investigating the Role of Design in the Development of Sustainable Packaging Systems. You have been approached to participate in this research as you have relevant experience and knowledge that can give a real insight into current industry issues regarding the development of packaging systems.

The significance of my research is that products associated with the packaging industry are a main focus in the global sustainability debate as they are perceived as a principal user of material resources. However, packaging as part of a product system contributes significantly to the success of other industrial and consumer product supply chains. The development of sustainable packaging systems is still seen by companies as a barrier to obtaining maximum profit of their sales; consumers’ expectations are to obtain a reduction in both the environmental impact and cost of a product and its packaging. Consequently there is an emergent demand for businesses to offer more environmentally responsible choices in their products.

In 1999 the National Packaging Covenant (NPC) was first introduced as a voluntary agreement between all levels of government in Australia and the packaging industry, to address the environmental impact of consumer packaging. One of the strategies proposed by the NPC to address such issues is through improved product design processes, which requires the consideration of decisions made on selecting materials, material efficiency, manufacturing, as well as end-of-life management during the development of the packaging.

The PhD research aims to investigate the processes involved in the design and development of packaging system strategies throughout the supply chain to identify the gaps and limitations in the decision-making processes currently utilised within organisations. This will allow for the identification of the opportunities for design to effectively meet business and marketing requirements, as well as integrate sustainable principles early within the new product-packaging development process. The anticipated outcome of the research is the refinement of a framework for those in the product-packaging development process to use as an integral tool in the development of sustainable packaging systems.

The proposed methodology involves conducting face to face interviews with professionals (± 30) involved in the food packaging industry. Potential participants come from different sectors in the packaging industry such as marketers, designers, supply chain managers, environmental managers, packaging engineers and technologists; distribution and logistics managers; material suppliers and packaging manufacturers; retailers and government representatives.

If you agree to participate, you will be required to answer ±10 semi-structured questions on issues in the packaging industry, identifying opportunities and barriers for the development of sustainable packaging systems, which should not take more than 1 hour to complete. You will also be asked to give written permission for the tape-recording of the interview, in order to facilitate the transcription of results.

The project is for the purpose of research, and participation is absolutely voluntary. You are free to withdraw from the project at any time and to withdraw any unprocessed data previously supplied. The research outcomes may benefit the packaging industry in general and other aspects of the supply chain, and may not be of direct benefit to you.
The privacy of the information you provide will be safeguarded and the security of the research data is assured, during and after completion of the study. The data collected during the study may be published; however, reference to participants’ names and their organisations will not be disclosed at any time.

You are advised that the research is being funded by the Mexican Government; however that does not compromise your participation or the information you provide in any way.

Dr. Karli Verghese, from the Centre for Design at RMIT University is the senior supervisor of this research. Should you need further information, or if any questions/problems arise concerning this research project, do not hesitate to contact her at 9639 3412 or Karli.Verghese@rmit.edu.au.

Kind regards,

Areli Avendano  
B. in Dsn (Hons)  
M. in Dsn  
Mob. 0423 63 91 54  
Email: s3122855@student.rmit.edu.au

Any complaints about your participation in this project may be directed to the Secretary, RMIT Human Research Ethics Committee, University Secretariat, RMIT, GPO Box 2476V, Melbourne, 3001. The telephone number is (03) 9925 1745. Details of the complaints procedure are available from: www.rmit.edu.au/council/hrec
appendix E: Interview e-mail invitation

My name is Areli Avendano and I am an industrial designer researching “the role of design for packaging sustainability” at the Centre for Design at RMIT. I am contacting you because [insert reason based on expertise, referred by someone else, etc.], and I would like to invite you to be part of a series of interviews that I am conducting in the next few months.

This project consists of a series of conversations with experts and professionals involved in design practices within the packaging industry, to discuss issues of packaging design and sustainability within the industry context. The interview is estimated to take approximately 45 mins, depending on your availability. In a general sense, the topics to discuss include:

- Packaging industry
- Packaging design
- Packaging sustainability

If you are interested in participating or would like to know more about the project, please contact me at your earliest convenience indicating a phone number on which I can contact you for further discussion of your potential participation.

Thank you for your time, and I look forward to hearing from you!

Best Regards,

Areli Avendano
PhD Scholar

http://www.cfd.rmit.edu.au/services/research_consulting/staff_areli_avendano
RMIT/ Centre for Design
Sustainable Packaging Alliance
areli.avendano@rmit.edu.au
T: 9925 9890