

# MANAGING PACKAGING DESIGN FOR SUSTAINABLE DEVELOPMENT

A COMPASS FOR STRATEGIC DIRECTIONS



DANIEL HELLSTRÖM & ANNIKA OLSSON

WILEY



## **Managing Packaging Design for Sustainable Development**



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A Compass for Strategic Directions

*Daniel Hellström and Annika Olsson*

*with contributions from  
Fredrik Nilsson*

**WILEY**

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## Contents

<b>About the Authors</b>	<i>xi</i>
<b>Preface</b>	<i>xiii</i>
<b>Acknowledgements</b>	<i>xvii</i>

### **Part I Fundamentals of Packaging Design 1**

<b>1 Introduction to packaging</b>	<b>3</b>
1.1 Multiple functions of packaging	3
1.1.1 Containment	4
1.1.2 Protection	4
1.1.3 Apportionment	5
1.1.4 Unitization	5
1.1.5 Convenience	5
1.1.6 Information	5
1.1.7 Communication	6
1.2 Packaging legislation and regulations	6
1.2.1 Administrative legislation and regulations	7
1.2.2 Legislation and regulations for protecting the public	7
1.2.3 Legislation and regulations for protecting designs	7
1.2.4 Legislation and regulations for protecting the environment	8
1.3 Packaging terminology	9
1.4 Packaging as a system	10
1.5 Packaging goes beyond a single discipline	12
1.6 Going multidisciplinary – packaging logistics	13
References	14

<b>2 Sustainable development and packaging</b>	<b>17</b>
2.1 Sustainable development goals	17
2.2 Three pillars of sustainable development	19
2.2.1 People	20
2.2.2 Planet	20
2.2.3 Profit	20
2.3 Looking back at the role of packaging	21

- 2.4 Misconceptions of packaging 23
  - 2.4.1 Overpackaged or underpackaged? 23
  - 2.4.2 Wasteful or useful? 25
  - 2.4.3 How about the R's in waste hierarchies? 26
- 2.5 Packaging contributions to sustainable development 27
  - 2.5.1 The reasons for packaging 27
  - 2.5.2 Adding value for people, profit and planet 28
- 2.6 Packaging contributions to sustainable development for supply chains 29
  - 2.6.1 The research on sustainable supply chains 29
  - 2.6.2 The packaging impact in retail supply chains 31
- References 31

- 3 Designing packaging 35**
  - 3.1 The complexity of packaging design 35
    - 3.1.1 Layer one – packaging functions 36
    - 3.1.2 Layer two – the packaging system 36
    - 3.1.3 Layer three – functions and departments within organizations 37
    - 3.1.4 Layer four – between organizations 37
    - 3.1.5 Layer five – end consumers 37
    - 3.1.6 Layer six – distribution channels 38
    - 3.1.7 Layer seven – extending or closing the loop in circular systems 38
    - 3.1.8 Layer eight – time 39
  - 3.2 Challenges of dealing with the complexity 39
    - 3.2.1 Taking a holistic approach to packaging 40
    - 3.2.2 Integrating form and function 41
    - 3.2.3 Making trade-off decisions 42
    - 3.2.4 Sharing the risks and gains 43
  - 3.3 Organizing and managing packaging design 45
    - 3.3.1 Design thinking processes 45
    - 3.3.2 Managing the team 47
  - 3.4 Tools for packaging design 49
    - 3.4.1 Divergent phase tools – identifying needs and generating ideas 50
    - 3.4.2 Convergent phase tools – decision-making support 53
    - 3.4.3 Packaging evaluation and assessment 54
    - 3.4.4 Environmental evaluation and assessment 54
    - 3.4.5 Packaging design software and guidelines 56
    - 3.4.6 Strategic guidance towards sustainable development 57
  - References 58

## **Part II A Packaging Design Compass for Sustainable Development 63**

- 4 Introducing the compass 65**
  - 4.1 Points of the compass 65
  - 4.2 Users of the compass 66
  - 4.3 How to navigate 67
  - 4.4 The making of the compass – our methodology 68
- References 70



<b>5</b>	<b>The directions of the compass</b>	<b>71</b>
5.1	Protection	71
5.2	Material use	72
5.3	Fill rate	73
5.4	Apportionment	74
5.5	User-friendliness	76
5.6	Information and communication	77
5.6.1	Information abilities	78
5.6.2	Communication abilities	79
	References	79

### **Part III Practical and Illustrative Cases 81**

<b>6</b>	<b>Product protection</b>	<b>83</b>
6.1	Better quality grapes for the people	84
6.1.1	The table grapes packaging system	85
6.1.2	The table grapes supply chain and challenges	86
6.1.3	Supply chain implications	89
6.2	Cheap is not always the best: The citrus box	90
6.2.1	The citrus packaging system	91
6.2.2	The citrus supply chain	91
6.2.3	Key handling activities	91
6.2.4	Challenges in the citrus supply chain	92
6.2.5	Supply chain implications	93
6.3	IKEA <i>Ektorp</i> sofas: Knock-down boxing	94
6.3.1	The previous packaging solution	95
6.3.2	Managing damages	95
6.3.3	Packaging redesign and impacts	96
6.3.4	Concluding remarks: Knock-down boxing	98
	References	99
<b>7</b>	<b>Material use</b>	<b>101</b>
7.1	Know and adapt your food packaging material	102
7.1.1	Food protection through packaging	102
7.1.2	Different packaging materials	103
7.1.3	Consumer preferences	105
7.1.4	Packaging technologies for increased shelf life	105
7.2	Can or no can? The <i>Tetra Recart</i> retortable package	108
7.2.1	The package configuration and the redesign	108
7.2.2	The comparison – sustainability implications	111
7.3	Wine in glass or plastic bottles	114
7.3.1	The packaging system	115
7.3.2	Supply chain description	115
7.3.3	From glass to PET	116
7.3.4	Other packaging alternatives	117
7.3.5	Implications from using PET wine bottles	117
7.4	Facing the orange juice brand	118

- 7.4.1 The package configuration and the redesign 119
- 7.4.2 The comparison of the packaging systems 119
- 7.4.3 Sustainability implications 121
- 7.4.4 Concluding remarks: Facing the orange juice brand 122
- References 123

## **8 Fill rate 125**

- 8.1 Detergent powder packaging: Less is more 126
  - 8.1.1 The detergent powder packaging system 126
  - 8.1.2 The detergent powder supply chain 127
  - 8.1.3 Suggested packaging improvements 128
  - 8.1.4 Potential implications 129
  - 8.1.5 Concluding remarks: Less is more 130
- 8.2 Ice cream packaging: Brick or elliptic shape? 132
  - 8.2.1 *GB Glace* brick packaging system 132
  - 8.2.2 *SIA Glass* elliptic packaging system 134
  - 8.2.3 Supply chain descriptions 134
  - 8.2.4 Comparing packaging solutions: A scenario 136
  - 8.2.5 Concluding remarks: Brick or elliptic shape? 137
- 8.3 IKEA loading ledges: It's not rocket science, but it is about space 139
  - 8.3.1 Implementation – from 2001 to 2010 141
  - 8.3.2 Supply chain impact 141
  - 8.3.3 Concluding remarks: It's not rocket science, but it is about space 144
  - 8.3.4 Epilogue 145
- References 146

## **9 Apportionment 149**

- 9.1 Apportion for less product waste 149
  - 9.1.1 The salmon packaging system 151
  - 9.1.2 The impact of primary package apportionment 152
  - 9.1.3 Concluding remarks: Apportion for less product waste 153
- 9.2 Appropriate numbers in shelf-ready packaging 154
  - 9.2.1 The toothpaste packaging system 154
  - 9.2.2 The toothpaste supply chain 154
  - 9.2.3 Reapportionment for easier handling and improved fill rates 155
  - 9.2.4 Supply chain implications 157
- 9.3 The quantity of bottles in boxes 158
  - 9.3.1 The wine packaging system 158
  - 9.3.2 The wine supply chain in South Africa 159
  - 9.3.3 Improvement potentials identified 159
  - 9.3.4 The *Absolut Vodka* packaging system 159
  - 9.3.5 The *Absolut Vodka* supply chain 160
  - 9.3.6 Potential packaging modifications and implications 161
  - 9.3.7 Concluding remarks: The quantity of bottles in boxes 161
- References 162

<b>10</b>	<b>User-friendliness</b>	<b>165</b>
10.1	Pharmaceutical packaging: Does size matter?	166
10.1.1	The <i>Alvedon</i> supply chain	166
10.1.2	The <i>Alvedon</i> packaging system	167
10.1.3	Implications from a user-friendliness perspective	167
10.1.4	Sustainability implications	169
10.2	Less frustration, less injury and less handling	171
10.2.1	The controlled delamination invention	171
10.2.2	CDM sustainability implications	172
10.3	TORK hand towels: Carrying to caring	174
10.3.1	The previous TORK packaging system	175
10.3.2	The TORK supply chain	175
10.3.3	Packaging evaluation and redesign	176
10.3.4	Supply chain impact	178
10.3.5	Concluding remarks: Carrying to caring	179
	References	179
<b>11</b>	<b>Information and communication</b>	<b>181</b>
11.1	How do you know if the milk is sour? An innovative sensor technique	182
11.1.1	Implications of supply chain implementation	184
11.1.2	Sustainability implications for the indicator invention	185
11.2	Mobile communication through the package	187
11.2.1	The packaging system	188
11.2.2	Packaging impacts on the markets	188
11.2.3	Suggestions for primary packaging improvements	189
11.2.4	Sustainable supply chain implications	189
11.3	Roll containers for dairy products: Connecting atoms and bits	191
11.3.1	Implementing a tracking system	193
11.3.2	Implementation results	193
11.3.3	Concluding remarks: Connecting atoms and bits	195
11.4	What does the silent salesman do for a sustainable society?	196
11.4.1	Dishwashing tablets	197
11.4.2	<i>PlantBottle</i>	198
11.4.3	Locally produced baby food	199
11.4.4	Organic cheese packaging	200
11.4.5	Separable dairy package	200
11.4.6	Three for the price of two	201
	References	202
	<b>Afterword</b>	<b>205</b>
	<b>Index</b>	<b>207</b>



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## Preface

This book is about packaging design for sustainable development, the kind of design that can make our lives friendlier, our planet greener and our businesses richer.

It is necessary and obvious that we need to move towards a more sustainable society, as we see more pollution in our oceans, more waste in our streets, more landfills and the tremendous waste of essential resources such as food on our planet. Despite the negative effects that packaging might have on our world, we need to see the other side of the coin and ask: What can packaging do to contribute to sustainable development? Interestingly enough, there is research evidence indicating that packaging design initiatives have a major impact on sustainable development.

Packaging design is a powerful vehicle for change in making the transition to a more sustainable society. What is missing is a compass that can guide practitioners in the right direction. This is particularly so in the field of packaging, where the routes you take may contradict rather than contribute to sustainable development. *Managing Packaging Design for Sustainable Development* presents a compass for you to find the path to get there. With the compass we encourage you to go off-road, to develop and innovate, and to remake the packaging design solution that previously was best practice. In a world of continuous change, technology, people and organizations keep changing the routes we take to attain sustainable development. In this world, a compass is more important than ever before.

The intention of this book goes beyond presenting a compass. The overall ambition is to bring order out of chaos in a multidisciplinary field where misconceptions and contradictory views are more dominant than the coherence and recognition of its importance. *Managing Packaging Design for Sustainable Development – A Compass for Strategic Directions* is strongly grounded in the concept that the book as a whole has a far more important story to tell than presenting every little detail. Even though reading the book makes you zoom in on packaging design, its aim is to empower you to zoom out and gain a holistic view that considers the many packaging design contributions to sustainable development. Consequently, it is not intended to be a reference book *per se*, but rather an inspirational guide to this complex and important topic.

In line with that ambition, the book aims to reach the minds of all professionals and companies that have, or do not have, packaging as a core competence or

business. Packaging design is a cooperative team effort of people from multiple disciplines. Thus, there are many professionals from various disciplines, company functions and departments for that matter, who are involved in packaging design. This can include professionals from R&D, production, marketing, sales, finance, purchasing, logistics and regulatory. For a majority of these professionals, packaging is not their core competence. This book provides them with guidance so that they can navigate the packaging landscape. Yet, for highly experienced professionals in the realm of packaging design, the book provides great inspiration and valuable new ways of thinking.

Theory and practical applications are balanced by dividing this book into three integrated parts. In Part I, the basic tenets of packaging, sustainability and design are presented to make the book more managerial, integrative and “cutting edge”. Views on sustainable development and packaging design are also subjects that you will become acquainted with in Part I. It “sets the scene” for what is to come: the packaging design compass for sustainable development. Part II is the focal point of the book. It describes the compass in detail, its directions and how to navigate with it. Part III exemplifies the compass directions in a wide range of illustrative cases that help readers to understand and gain insights into explorative, comparative and real-life cases. It aims to inspire and challenge the mindsets of those who apply the compass in packaging design related projects. The case material is integrative in nature and examines directions of the compass that are important for sustainable development. The cases are structured to inspire readers in the challenging task of packaging design thinking.

Packaging design for sustainable development is a field in its infancy, veiled behind preconceived myths and misconceptions. There is a tremendous amount of knowledge that needs to be generated and disseminated, and there is considerable interest from industries and academia to take in and apply this knowledge. *Managing Packaging Design for Sustainable Development – A Compass for Strategic Directions* is the only publication that takes a broad supply chain orientation and views the subject from a sustainable development perspective. While emphasizing the supply chain aspects of packaging, it integrates all three pillars of sustainable development as well as incorporating how to make strategic decisions in relation to packaging design. In addition to the compass, there are several important topics that are unique to this book or are approached in a new way. Examples are the complexity and challenges of packaging design, and the packaging logistics perspective as such. The multidisciplinary themes are interwoven throughout the chapters.

This is a must-have book for designers, engineers, logisticians, marketers, SCM professionals and other managers who seek guidance on sustainable solutions through packaging design. The nature of the book is pragmatic and applied in its approach to managing packaging design for sustainable development. It is also a valuable source of knowledge and practical experience for students, public officials, researchers, policymakers and many others who have a strong interest in packaging design and sustainable development. It fills the gap in the scarcity of books about the crucial role packaging design plays in sustainable development. It clearly takes a giant leap from thinking of “sustainable packaging” to



thinking of “packaging design for sustainable development” by comprehending the whole rather than the separate parts.

As with packaging design processes, the outcome of this book has been a journey of iterations based on the authors’ many years of experience. This has been intertwined with the practical cases and integrated with the existing but sparsely reported research in the field. The journey has taken several directions. It has consisted of real-life presence and off-road imaginary thoughts. At the end of this journey, we wished we’d had a compass. Yet without a compass, we still feel we have moved in the right direction by contributing to and inspiring packaging professionals and communities to strive for a more sustainable world.

Lund, on Leap Day, 29 February 2016  
Daniel Hellström and Annika Olsson



## Acknowledgements

There are many people and organizations that contributed to the research behind this book, and who supported us in different ways during its actual writing.

The Bo Rydin Foundation has been the first and foremost funder from the start. Its donation to Lund University in 1994 founded packaging logistics as an educational and research subject area. The research group has since grown and established itself and is internationally recognized. This book is based on this original packaging logistics research. Without the initial donation and ongoing funding from the Foundation, neither the area of packaging logistics nor this particular book would have come into being.

The idea for the book came up during a research project funded collaboratively by two Swedish funding bodies, “Formas” and “Handelns utvecklingsråd”, under their programme “Sustainable Retail”. We were specifically funded for a project called “Packaging Design for Sustainable Development of Retail”. As a result, we developed the first prototype of the compass and investigated, gathered and authored all the illustrative cases in the book with our colleague, Professor Fredrik Nilsson.

We are grateful to all the people and companies for the time spent sharing their insights about the cases and for providing us with the case material. We have specifically acknowledged your support in conjunction with each case.

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## Part I

# Fundamentals of Packaging Design

Packaging is something that we interact with on a daily basis. Most of the time we do not even notice it, since packaging is fully integrated into our lives and personal use, as well as with the product inside. Can you imagine what the world would be like without packaging? Packaging ensures that the products of the world reach the consumers of the world. Some people may argue that because packaging is not part of the product, it is not needed and should be restricted or even banned. When we eat, we are safeguarded because our food has been protected by packaging. When we are sick, our pharmaceuticals are safe, efficient and not counterfeit, due to effective packaging. There would be no need for packaging if the products themselves were resistant to everything in all types of surroundings, if they did not have to be moved, and if they were not time dependent. But as we all know, this is not the case nor will it be in the future. This is why packaging is a prerequisite for safe production, distribution and consumption.

In many parts of the world packaging is an intrinsic part of businesses, industries, institutions and authorities. In businesses, packaging plays an important role in the renewal and extension of product life cycles and is recognized for its positive effects on productivity, its financial impact and its value creation. Packaging is a global business with an annual turnover of close to €500 billion that is growing in line with the global economy. For governments, packaging does not only affect the national economy but also its legislation. For society as a whole, packaging is a vital element in enabling population growth, fostering new and changing habits and life styles, creating employment and trade and most importantly, contributing to the availability of products around the world.

Part I of this book – *Fundamentals of Packaging Design* – is made up of three chapters. The first, “Introduction to packaging”, is where the functions, legislation, regulations and terminology of packaging are explained to introduce you to the world of packaging systems. The chapter ends by describing the multidisciplinary nature of packaging and the role of packaging logistics. Chapter 2 is about “Sustainability development and packaging”. Here we present the definition of sustainable development, the historical role of packaging, and common misunderstandings about packaging. We also elaborate on how packaging can effect

and encourage sustainable development. In Chapter 3, “Designing packaging”, packaging design is examined from various points of view to explore the “brilliance” and complexity of its numerous aspects and facets. The management, practices and tools of the packaging design process are also presented. The numerous requirements and needs of packaging are described, followed by the design challenges in dealing with this complexity.

## 1 Introduction to packaging

Packaging is the science, art and technology of protecting and adding value to products. In order to fulfil these tasks, it is necessary to integrate the processes of designing, evaluating and producing packages, which also involves the elements of materials, machinery and people. People have a variety of views on packaging. One of the more limited views is reflected in the question: What packaging material is better than another? In reality, material is only one element of packaging, one which is highly dependent on the product that is about to be packed. This limited view needs to be supplemented by others in order to take in all the different perspectives of packaging and the functions it has throughout its life cycles. To clarify the meaning of packaging, a broad and well-established packaging definition is needed. The definition we use in this book is based on Paine's (1981) well established version and the EU's definition (94/62/EC). It is expressed in three statements:

- 1) Packaging is a coordinated system made up of any materials of any nature, to be used for preparing goods for containment, protection, transport, handling, distribution, delivery and presentation.
- 2) Packaging is the means of ensuring safe delivery from the producer to the ultimate consumer in sound and safe conditions.
- 3) Packaging is a techno-economic function aimed at making delivery efficient while maximizing effectiveness.

The package itself is defined as the physical artefact that performs the many functions required from different stakeholders and from the product. This is our jumping off point for further elaboration on the different functions of packaging.

### 1.1 Multiple functions of packaging

The principal functions that packaging is able to perform are manifold. Several authors and researchers in the packaging field have described and defined them in various ways. Paine (1981), Robertson (1990) and Livingstone and Sparks (1994) emphasize seven fundamental functions of packaging for the product

to be: protection, containment, preservation, apportionment, unitization, convenience and communication of the product. Lockamy III (1995) lists the same functions, but excludes preservation, which mainly relates to food and other perishable products. In Lockamy III's assessment of strategic packaging decisions, the six main functions of packaging are: containment, protection, apportionment, unitization, convenience and communication. These six fundamental functions are the ones that most researchers acknowledge and use, even though some of the functions have been developed and expanded. For example, the protection function can be divided into physical and barrier protection. Others researchers integrate functions by merging the above-mentioned six into broader categories. Lindh et al. (2016) propose three main functions: protect, facilitate handling and communication. Another way of categorizing packaging is to use process-related aspects such as security, marketing and information transmission as specific functions. One can claim, though, that security can be sorted under the protection function, as well as under communication; marketing and information transmission can also be sorted under communication (Lindh et al., 2016).

We could take any of the above-mentioned set of functions as our starting point, but have chosen Lockamy III's (1995) six main functions because they are the most commonly used and referred to. We have also added information as a function of its own.

#### **1.1.1 Containment**

The purpose of containment is to hold the content and keep it or the surroundings secure. The second part of this definition is similar to protection, but more clearly signals the activity of collecting things into an assembled unit. Many products need containment because of their nature, the classic example being liquids. Since products come in all shapes and sizes and react in different ways to their surroundings, some kind of containment is necessary. Imagine the process of getting pasta or rice to your dinner table without packaging. Containment highlights the need for the existence of packages in making products available to consumers.

#### **1.1.2 Protection**

The protection function of packaging involves safeguarding the contents of the package from external sources and vice versa. Damage can arise from physical, chemical, microbiological and climatic sources. Packaging provides physical protection against many different static and dynamic forces, such as vibration, compression and mechanical shock. It also protects from climatic conditions and hazards, such as temperature and humidity. From a chemical and biological point of view, it protects the product from microbiological or chemical deterioration, which is also a preservation function. Preservation means retaining the quality of the content by stopping or inhibiting chemical and biological changes. It can be regarded as part of the protection function because it is usually managed by choosing a proper packaging material. Preventing damage from external sources is often considered the main reason for having packaging.