Investigation into the drivers and barriers affecting refillable packaging

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SUMMARY: Over the past 40 years considerable efforts have been made to reduce the environmental impacts of packaging by focusing on issues such as light-weighting and material selection. However, although these redesign approaches are commendable and should be encouraged, they are not having a radical effect on reducing the environmental impact of packaging or addressing the broader issues of sustainability. Refillable packaging systems may provide part of the solution to this problem, however in the past attempts to extend the use of refillables beyond a few traditional areas have met with little success (Darlow, 2003). In recognition of this a collaborative research project - 'Refillable packaging systems', between Loughborough University, The Boots Company and DEFRA set out to investigate amongst other things, the barriers and drivers found to influence the adoption and success of refillable packaging. This paper reports on those findings.

1 INTRODUCTION

In recent years attempts to make packaging more resource efficient have generally taken a 'green design' approach, focusing on single issues such as light-weighting and material selection. These approaches have resulted in some reduction in the environmental impact of packaging (Lewis et al., 2001; Holdway et al., 2002). However, whilst the weight of packaging per unit of product has decreased, changes in demographics and lifestyles such as smaller family size and a demand for greater convenience (INCPEN, 2001) have led to an overall increase in the total amount of packaging used and disposed of. In 2003 total packaging waste in the UK rose to over 10 million tonnes (Environmental Services Association, 2004). As such it is widely accepted that approaches to dramatically reduce the amount of packaging waste going to landfill need to be identified.

The use of refillable packaging has long been cited as a possible solution to this problem, however in the past attempts to extend the use of refillables beyond a few traditional areas have met with little success and as of mid 2003 no major retailers in the UK operated any schemes in the reuse of primary packaging (Darlow, 2003). Investigations into the

perceptions of retail supply chains identified four specific factors as to why it was felt reuse of this nature would not work in the UK on a large scale; Health & Safety and Hygiene Regulations, the logistical complexities of a multidirectional supply chain, price of new packaging; and customer behaviour (Darlow, 2003). However, interest in the opportunities offered by refillable packaging still remains, as illustrated by the funding support currently being provide by DEFRA and WRAP to investigate this area. The project reported on in this paper is one such undertaking.

In recognition of the fact that current packaging design fails to reflect the radical changes needed for sustainability, a collaborative research project between Loughborough University and The Boots Company, has been funded by DEFRA to investigate the feasibility of developing refillable packaging systems which appeal to the consumer whilst reducing the overall sustainability impact. The project, which runs from January 2006 – December 2007 will involve developing refillable packaging concepts for a 'body wash product' and testing them on consumers, with the aim of identifying new opportunities for refills to be used in the personal care market.

In order to begin to understand the way in which refills would need to operate within the market one of the first objectives of the research was to identify drivers for and barriers to the adoption of refillable packaging. In the fulfilment of this objective the research aimed to develop Darlow's findings and investigate specifically the drivers and barriers associated with business, the consumer and sustainability. This paper reports on these findings.

2 METHODOLOGY

In the early stages of the project, the team recognised that there are many different types of refillable packaging. Through a market analysis and a literature review, sixteen different types of refillable packaging were identified and classified with respect to their delivery mechanism and the level and nature of their consumer/business interaction. These findings are outlined in Table 1 along with images and examples to further explain the way in which each type of refill is used.

Table 1 Types of Refillable Packaging

	Refill Example	Refill Approach	Description
1		Lightweight self contained refill delivered through dispenser	Customer buys a self contained refill which they take home and put into their durable dispenser. Applications include Wipes, face creams, razors, cosmetics, fabric conditioner & air fresheners.
2		Lighter weight refill through part reuse	Customer buys a new bottle of product and reuses the spray pump. Applications include cleaning products.
3		Empty packaging refilled in shop	Customer takes the original packaging back to the store for it to be refilled with the same product. Applications include shampoo, conditioner, shower gel, bath

			products and fabric conditioner.
4		Self dispense	Customer takes reusable container back to the store where they refill it with the same product. Applications include dry goods, personal care products and cosmetics.
5		Original packaging swapped for new product	Customer returns empty packaging to a unit where they leave it and pick up a new product. The old packaging is refilled for future use by someone else. Applications include toner cartridges and single use cameras.
6		Door to door delivery – packaging replaced	On demand the customer receives full packaging and leaves empty packaging for supplier to collect, when they are finished. Returned packaging is refilled for other customers. Applications include milk bottles and vegetable box system.
7		Deposit system	Customer returns empty packaging to supplier for a financial incentive. Applications include soft drinks bottles and beer bottles.
8		Top up card	Customer pays for a service which is delivered on the production of the payment card. Applications include downloadable music and payment systems for services such as mobile phones.
9		Creation	Customer buys the constituent parts to make the product themselves. They buy refills to allow them to repeat the process. Applications include soft drink makers and orange juicers.
10		Door to door delivery – packaging refilled	Customer dispenses quantity required from a delivery van, using special containers and only paying for the quantity taken. Applications include detergent products.
11		Refilled with different product	Once original packaging has been used it is refilled with a different product. Applications include toys filled with sweets or durable packaging used to store other products in.
12	http://images-eu.amazon.com/images/P/B000008BQY.01.LZZZZZZZ.jpg	Dispensed concentrate	Customer buys a dispensing unit. They also purchase refills containing concentrated product which are delivered through the dispenser. Applications include coffee machines.
13		Dispensed product	Customer buys a dispensing unit. They

			also purchase refills which are delivered through the dispenser. Applications include personal care products in showers.
14		Concentrate mixed in original packaging	Customer buys a concentrated refill which they dilute with water and mix using the old packaging. Applications include laundry products.
15		Fill your own packaging	Customers fill their own packaging with product in shop.
16		Bulk purchase	Customer buys in bulk and refills a sampler package at home. Applications include cooking ingredients (such as oil, vinegar, peppercorns) and household cleaning products.

Each of the sixteen different types of refills identified above combines a unique set of features which make them more or less suitable to different types of markets. Along with the results of a questionnaire to investigate consumer perceptions of refills and a workshop with Boots personnel to investigate perceived organisational barriers and drivers of refills, further analysis was carried out to identify the likely drivers and barriers for the adoption of each type of refill from the perspective of business, the consumer and sustainability (Bhamra and Lofthouse, 2006). The following sections outline a summary of these findings, presenting the general drivers and barriers identified.

3 DRIVERS FOR THE ADOPTION OF REILLABLE PACKAGING

3.1 Business Drivers

From a business perspective there are a number of drivers for using refillable packaging. The first is the opportunity to develop closer connections with customers by tying them into a relationship with a product. This can be achieved via two different approaches. In the first approach, the customer buys some form of ‘parent’ hardware (e.g. razor, coffee machine, or soap dispenser) often at a relatively low price with some ‘free’ refills thrown in. Subsequent refills, often designed to only operate with their intended ‘parent’, are then sold at a higher profit margin. This has the effect of tying the customer into the particular brand. These types of refills also often use lightweight packaging design which can be manufactured at a lower cost, use less materials and can lead to reduced transportation costs. In the second approach, customers’ sign up to a service which ‘binds’ them to their selected supplier, as in the case of door-to-door milk delivery. Unless the company disappoints the customer in some way, it is likely that they will continue to supply the service in question. This type of high level buy-in is a key driver for service oriented solutions.

A further driver can be the innovation opportunities that new delivery systems create. Napster created a new market for delivering music to the masses through the creation of their 'top-up' card, which is sold in Post Offices around the UK. Other examples of new business opportunities derived from thinking about refills differently can be seen through the approaches taken by Allegrini S.p.A, an Italian producer of detergents and cosmetics, who developed 'Casa Quick' a service for the home delivery of detergents. Casa Quick products are taken from vans, which move from house to house on a regular route. Each family takes the detergents needed from the van in the quantity required using special containers and only pays for the quantity taken (Manzini and Vezzoli, 2002).

There are less radical drivers for moving to refills. Lower costs, which have already been mentioned, are also a driver for companies to introduce bulk containers which can be used to refill packaging returned by the consumer. Bulk containers reduce overall material usage as well as reducing processing costs and the need for elaborate sales packaging. Similarly, refillable packaging that is returned to the manufacturer for reuse, also results in reduced materials and processing costs.

A final business driver for refills is the improved sustainability image that their use can lead too. In recent years the environmental impact of packaging has become a prominent issue in the UK as it is a very visible product in the waste stream, making up around one-third of household rubbish (LRRA, 1996). Many consumers recognise that refills use fewer materials and can generate less waste. As such, as long as product quality is maintained, refills can attract customers who wish to support companies who are projecting a more sustainable image in their packaging design.

3.2 Consumer Drivers

In much the same way as for any other product, there are a number of drivers which may encourage consumers to purchase refills – these can generally be categorised as those which add value or those which reducing costs.

Added value can be provided in a number of ways - through increased quality, quantity, durability, choice, portability, availability and adaptability. For example, customers, who do not have the use of a car, report that they purchase some refills specifically because they tend to be lighter and smaller to carry home from the shops. Some refill designs also offer the consumer a degree of product customisation; this can be an attractive feature of refills from a consumer viewpoint. Other refills such as coffee machines and vegetable boxes offer customers increased product choice and variety.

Reduced costs will always be a key driver for some customers. A number of customers specifically highlighted the cost reductions which can be achieved on product such as baby wipes, by foregoing the dispensing unit and only buying the refill pack. The disadvantage of this behaviour from the business perspective (aside from loss of revenue) is the potential rebound effect if the quality of the product delivery is reduced as a result. Other refill systems provide consumers with a financial incentive, by offering money back on returned packaging as was the case with lemonade bottles in the 1970s. This type of driver may encourage consumers with no interest in refillables to engage with the approach in return for financial rewards.

Finally, there is a growing group of 'green' consumers who recognise the sustainability benefits provided by refillable packaging and will actively seek out packaging of this nature.

3.3 Sustainability Drivers

From a sustainability perspective the main drivers for the use of refillable packaging centre on their potential to minimise packaging. This reduces overall material use and therefore reduces resource depletion. A lighter weight refill also reduces the environmental impact of distribution as less energy is required to transport the product. In addition less material will end up in landfill if the refill is disposed of rather than recycled at the end of its life.

The use of refills can promote responsible behaviour in consumers and encourage them to consider resource efficiency and recycling or reuse of their products. By encouraging consumers to reuse their packaging significant environmental improvements can be made by reducing resource use, reducing waste to landfill and reducing energy in transport. Refills can therefore be used to educate the public more widely about sustainability issues.

4 BARRIERS TO THE ADOPTION OF REFILLABLE PACKAGING

4.1 Business Barriers

From a business perspective there are a number of potential barriers to adopting refillable packaging. Darlow (2003) specifically identified Health & Safety and Hygiene Regulations, the logistical complexities of a multidirectional supply chain, price of new packaging and customer behaviour. These barriers tend to be more relevant to some refill systems than others. For example Health & Safety and Hygiene Regulations will be especially relevant for any scenarios where packaging needs to be cleaned before reuse such as the case for milk bottles. In this particular example, the milk bottles are collected from the customer when a new product is requested. They are then returned to a depot where they are cleaned and refilled.

There are also a range of other barriers associated with specific refills. For example, for systems using lightweight refills it is often possible for these types of refill to be used without the parent pack, which means that the customer lock-in and brand loyalty that the refill was designed to create is lost. In addition competitors may bring our similar lower priced products which also fit the 'parent' pack, unless the original design is novel enough to be protected via patent.

For refills designed to be filled from bulk containers, additional costs for providing the space for the large containers used to refill the packaging will be incurred by the retailer, who will also have to stock the smaller refillable containers for first purchase. This is linked closely with the fact that extra staff would be required to run the 'refilling point' which would be a slower transaction than the usual system where the consumer selects the product from a shelf and then pays for it. This approach can also have health and safety implications within a store as any spilt product on the floor could be dangerous.

For scenarios where manufacturers plan to refill returned packaging in store, there will be added costs associated with storage, transportation and staff time. In addition to this the return of packaging may not necessarily be linked to sales of new products.

Other barriers are created by the additional stock requirements created by some forms of refill. For example, for many different types of refills it is necessary to stock not only the original product but also a refill for it. This requirement may reduce the shelf space available for other lines and consequently reduce profits.

4.2 Consumer Barriers

Inconvenience is the key barrier to refillable packaging, which can manifest itself in a number of different ways. For example some refills require consumers to undertake additional and sometimes complex operations in order to enable the refill system to operate. These tasks can include activities such as refilling smaller containers from bulk supplier, removing parts to enable containers to be refilled and even returning packaging to stores. Often these systems will require consumers to store larger containers of product within their homes in order to refill containers at a later date and this perception that this will be inconvenient can prevent many consumers adopting this approach. Another barrier for consumers is the inconvenience of either being unable to purchase the required refill (due to lack of stock) or being unable to identify the correct refill whilst in store (and subsequently buying the wrong one). Customers can also become disenchanted with a product if they do not consider it offers flexibility, for example if it only one type of refill fits the dispenser. Consumers also indicate frustration at refills that need to be completely empty (and washed) before they can be returned for refilling. This can lead to the frustration of running out of the required product. It is unlikely that neither a financial incentive nor the price of the product will be enough to encourage consumers to engage with a refill which is difficult and inconvenient to use.

Cost is another potential barrier to refillable packaging. When considering a service type of system, customers may deem the overall cost to be too high to engage in. Along the same argument, customers also recognise that buying refills for pre-purchased ‘parent’ dispensers can be expensive. To combat this, some other value-added incentive needs to be provided.

Another barrier to refillable packaging is ineffective communication. For example, if customers do not realise that packaging can be refilled they may simply dispose of it or recycle it, rather than allowing its full potential to be reached.

4.3 Sustainability Barriers

A key barrier to refills from a sustainability perspective, relate to when the system fails. In these cases they can lead to the generation of more, rather than less waste. For example, in refill systems where a ‘parent’ pack or dispenser is sold at a relatively low ‘introductory’ price as is often the case with razors and razor blades in the UK, consumers may not end up buying the refill, but instead opt to purchase another parent pack and dispose of the high value, spare pack.

Other barriers include the fact that sometimes sustainability benefits are very minimal due to the way in which the refill system has been designed. In addition some refill design faults

may result in customers stockpiling full packaging at home just in case there refill runs out before they can get to the shop and therefore they may be no reduction in material use of waste to landfill.

5 CONCLUSIONS

Whilst it is generally believed that the increased use of refills would lead to sustainability benefits for many sectors of industry it is clear from the analysis of the data that many barriers need to be overcome before this can be successful. At the same time the research has shown that there can be positive drivers for industry and consumers to encourage the increased use of refills. In order that these benefits can be realised future design of refills and the systems in which they operate must take on board these findings to ensure that the barriers are designed out and the drivers are enhanced.

Within the personal care market this project is now focussing on applying the lessons learned to the development of a refillable packaging system for 'body wash products' with the intention of developing a range of concepts suitable for prototyping and testing with consumer groups.

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