Sales Performance of Packaging
for Consumer Electronics Products

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ABSTRACT

The retail landscape for consumer electronics (CE) products has changed dramatically in the last two decades. Small independent retailers have made way for large retailers, selling CE goods in a supermarket way. Products are in their packaging on the shelf, to be grabbed by consumers in a self-service environment with a minimum of sales assistants available to provide advice. In such an environment the packaging has to make the product competitive. Taking the analogy with supermarkets further, the packaging may even try to trigger impulse purchases. To achieve this goal packaging for CE goods is increasingly becoming bigger, more colorful, and shinier. This is both costly and environmentally unfriendly. Therefore it is relevant to study impulse buying of CE goods in order to allow for design optimization, so that packages do not become bigger and shinier than necessary.

To study the extent to which impulse buying really plays a role for CE products a survey was held (N=295) first asking people about planned purchases and a month later asking about actual purchases and the reasons for these purchases. The results from this survey show that impulse buying has become a significant factor in selling CE goods. Furthermore it gives some clue for which products impulse buying is most relevant. Hence, packaging can play a role in convincing people of a need to have a product. Besides this, there is of course the communication of product features in the battle against competing products, where people recognize a need, but have not chosen a specific product.

To manage the design of sales packaging one needs to be able to measure it. Otherwise it is impossible to balance it with the logistical and environmental performance.

The sales performance of packaging consists of several aspects; 'attracting attention', 'communicating' and 'appealing'. For each of these aspects tests exist, but these may not all be usable in a business setting where limited budgets, and especially limited time, is available. This paper will present a first version of an internet-based sales performance measurement tool, aiming at providing product managers with sales performance data.

INTRODUCTION

In current day retailing of consumer electronics products (CE) major players dominate the field. These players are usually either hypermarkets or Category Killers. A hypermarket is a super-sized supermarket that sells both food and non-food. Examples are Wal-Mart in the US and Carrefour in France. Category Killers are large retail stores with a wide range within one clearly defined category (Spector, 2005). They usually aim at the price-conscious consumer. Examples are Best Buy in the US and MediaMarkt in Europe. Looking at the shop set-up (packed products on the shelf, minimum of sales support, self-service environment) these products are treated as if they were on equal footing with Fast Moving Consumer Goods (FMCG) or even totally commoditized goods. They are packed in expensive and voluminous packaging, trying to convince the consumer, both to buy something they were not planning on buying, and the buy a specific brand.

From an environmental point of view this type of packaging is unwanted. Far more material and transportation space is used than is needed from a protection point of view. Therefore it is sensible to check to what extend impulse buying actually takes place in the CE field.

INTERMEZZO: COMMODITIZATION OF CE PRODUCTS

Commoditization is the transformation of a non-commodity product into a commodity. Strictly speaking, a commodity is a product where consumers perceive no difference between the offerings of different suppliers or manufacturers, other than price. A typical example of a commodity would be flower or sugar. Hence CE products may currently not be a true commodity; however the term commoditization can be said to describe a process in which CE goods become like daily purchases in a supermarket. The term commoditization is widely used in literature (e.g. Spector, 2005 p.65-66, De Neufville and Pirnar, 1999, Greenstein, 2004). A commoditized product is characterized by low-margins, high competition and low importance of brands (De Neufville and Pirnar, 1999). Another characteristic, in particular related to consumer electronics products, is the decreasing time between replacement purchases, due to technological developments and price decreases (for example in the case of DVD players) (Minderhoud and Fraser, 2004).

Within CE goods one can see a trend towards commoditization. The classic example in literature is IBM and the commoditization of computers (De Neufville and Pirnar, 1999, Beaty, 1996). Commoditization can be understood as a development that turns luxury products into supermarket-like products. This is both reflected in the type of retail outlets where the products are sold and in the way people shop for such product; are they considered major family investment or are they more like impulse purchases. In such a supermarket-like environment marketing functions become increasingly important.

IMPULSE BUYING OF CE PRODUCTS

A lot of research has been performed on impulse buying, though mainly focusing on FMCG. Bayley and Nancarrow (1998) discovered that the difference between lifestyles one lives up to, leads to different impulsive behavior. Products that can contribute more to the (aspired) identity of the customer are more sensitive to being bought impulsively. For example, clothes are more likely to be impulse bought than, say basic kitchen equipment. A propensity to buy on impulse will be at its strongest when there is a perceived self-discrepancy between the actual self and the ideal self on the most important attributes to that person. According to Earl and Potts (2000), the longer the consumer stays in the store, the more money he will spend, assuming he is a browsing shopper. The average influence of the retailer on the final purchase of a consumer is 30%, according to LeBlanc & Turley (1994). They also discovered that there is a significant difference between different categories of products. For example, the influence of the retailer on the purchase of electronics is 35%.

In the Netherlands, small specialized stores are no competition for stores like MediaMarkt. The only factor customers seem to be focused on is the price. Therefore it looks like customers are much more sensitive to making an impulsive purchasing decision, based on a combination of price and selling promotions. Retailers can adapt on this trend, if the influence of this impulsive behavior is important to such a degree.

Method

A study was performed on the quantity of impulsive purchases. This study tried to answer the following research questions:

− Do impulsive purchases occur within the CE goods market?
− Is there a significant difference between the extents of impulsive purchases being made in different categories of CE goods in the Netherlands?
− Do impulsive purchases have a significant share on the total market of CE goods in the Netherlands?

Impulsive purchases are defined as unplanned purchases. CE goods are defined as electrical devices for domestic and recreational use.

The total market of CE goods is defined as the total amount of purchases having been made by the respondents in our research. Since this research is about the amounts of purchases, and not the amount of money, every purchase is counted as 1.

Basically, if one wants to research impulsive shopping behavior, one would have to ask people what they intend to buy before they go shopping, and what they bought, after they went shopping. However, according to Bayley and Nancarrow (1998), asking questions at the entrance of a shop will lead to socially desirable answers. For example, when asking people before they enter the store and after they left the store, they will go shopping with a different intention. They will be more aware of their behavior while shopping, which leads to different answers. Another method is to only ask people when they leave the store, about what they bought, and what they intended to buy. Bayley and Nancarrow (1998) mention in the same article, that this approach will lead to confusion of the respondent; most of the consumers cannot make a difference between their intention of products to buy before they go in to the store and their intention of products to buy when they are in the store.
Based on this it can be concluded that including a store in a research environment will not lead to a desirable outcome. Doing a survey in a "clean" environment is a better option. Here an online questionnaire was used. An advantage of an online questionnaire is that people do not have to talk about their behavior face to face. Behind a computer, it is only the respondent that matters, and no one will know. Also, behind a computer, there is no influence of disturbing environmental factors, and no disturbance of time. Also, an online questionnaire is a big time saver, when the group of respondents is intended to be large. The online questionnaire will be in two parts. In the first part the respondent is asked what he/she intends to buy the next month. In the second and last questionnaire, the same respondent will be asked what he/she has bought last month.

This includes the assumption that buying a CE product that one did not consider buying a month before that is an impulse purchase. This assumption is certainly believed to be true for large and expensive CE products, such as televisions and so on. The purchase is impulsive enough for the packaging to have an influence on buying such a product. For a category such as cables and batteries this might not be entirely valid.

A first questionnaire was mailed out in early November. Besides seven questions that asked about the personal situation of the respondent, our next question was:

> *From which categories of consumer electronics do you consider buying something from next month? Please fill in the amount per category. If you can't find your matching category, please fill in the category that corresponds the most with the product you intend to buy.*

To explain the categories chosen, a few examples of products from these categories were included in the questionnaire. The categories used are:

1.   Audio/visual large (such as TV, DVD player, beamer, gaming console)
2.   Audio/visual small (such as mp3-player, game boy, digital camera, car radio)
3.   Audio/visual accessories (such as headphones, memory card, remote control)
4.   Telecommunication (such as telephone, GPS system, palmtop computer)
5.   Telecommunication accessories (such as car kit, headset)
6.   Computer (such as laptop, computer)
7.   Computer accessories (such as printer, scanner, modem)
8.   Kitchen large (such as washing machine, dishwasher, air-conditioning, built-in oven)
9.   Kitchen small (such as toaster, food processor, microwave)
10.   Interior (such as alarm system, fire detector, alarm clock)
11.   Personal care large (such as solarium, electrical blanket)
12.   Personal care small (such as lady shave, electrical toothbrush, hairdryer)
13.   Cables and wires (such as plugs, audio/video switch, SCART cable)

A second questionnaire was sent out a month after the filled in first questionnaire was received. It asked which products were actually bought. This time the same categories were used, but now with a more extensive list of products belonging to this category.

To be able to analyze whether impulsive purchases are actually made, respondents were asked about their reasons that they bought the product. There are different reasons for a product being bought. Some of them could be an impulsive reason, others are not. These reasons were divided in two main groups for buying a product: for oneself or for someone else. If the product is bought for someone else, it can be a wanted present or a spontaneous present. If it is a product bought for oneself, it can be a replacement of a product or it can be a new product. When a product is being replaced, it can be for two different reasons; the old product was broken, or the old product was not broken. If it concerns a new product, the product can be bought also for different reasons. Regarding the variables, notice was taken of the price, the spontaneous treatment, and a wanted present for oneself. To make these different reasons clear, table 1 shows which of these reasons were considered to be an impulsive reason for purchasing.

Reason	Impulsive reason?
1. Wanted present for someone else	No
2. Spontaneous present for someone else	Yes
3. Spontaneous present for yourself	Yes
4. Replacement of a broken product	No
5. Replacement of a product that still works	Yes
6. New wanted product for yourself	No
7. This price was so low, I just had to buy it	Yes

Table1: explanation of impulsive reasons

This way it is possible to check if an impulsive purchase was made. It is only made clear to the respondents that the research was about shopping behavior, and it was not mentioned that the research was about investigating impulsive buying behavior. Also, these reasons are not confronting the respondent directly with having made an impulsive purchase.

Results

295 respondents filled in both questionnaires, so this is the final sample. From the data can be derived that by all the respondents, 703 products are bought in the last month. 199 products have been bought impulsively, which is 28,3 percent of the total amount of purchases. In total, the final database existed of 295 respondents who filled in both questionnaires. 105 of the respondents made an impulsive purchase. Out of the total amount of respondents, this is 35,6 percent. So 35,6 percent was responsible for the total amount of impulsive purchases. 703 products are bought by 295 respondents. This means that the average of products bought per respondent per month is 2,4. Table 2 shows how many products are bought impulsively, and how many products are bought in total per category.

Conclusion

Based on these data it can be concluded that impulse purchases occur in the field of consumer electronics. They actually make up a substantial percentage of the total. Especially the categories of audio/visual large (such as TV, DVD player, beamer, gaming console), Kitchen small (such as toaster, food processor, microwave), and Interior (such as alarm system, fire detector, alarm clock) scored high; roughly a third of the purchases in these categories can be classified as impulse purchases.

When looked at from the other side, the largest part of impulse purchases are in the category of computer accessories (such as printer, scanner, modem, 19,6%) and audio/visual large (16,6%).

As impulse buying is just part of the marketing function of the packaging (the other being competition with other brands in a certain category for the attention of consumer for a planned purchase) the application of a sales packaging seems justified. However, one would still like to see a balance between sales functionalities and economical and environmental functionalities.

Total impulse per category	Total bought per category	Category
33	90	Audio/Visual large
14	57	Audio/Visual small
19	81	Audio/Visual accessories
9	39	Telecommunication
3	15	Telecommunication accessories
6	30	Computer
39	128	Computer accessories
9	34	Kitchen large
11	13	Kitchen small
23	64	Interior
0	2	Personal care large
6	28	Personal care small
27	104	Cables and wires
199	703	

Table 2: products bought impulsively per category

NEED FOR A TOOL

Packaging design is all about optimization and compromise between different functionalities. It would be perfectly possible to optimize pack designs for CE products by balancing marketing functions on the one hand (sales performance, tamperproof, unpacking experience) and economic and environmental functions on the other hand (distribution efficiency, material usage). To do so does however require information about performance. The more detailed this information is the better the optimization can be performed. The problem occurs when the performance on one of the functions is known only vaguely. In the case of consumer electronics this is the sales performance. (Direct) cost and environmental impact can be calculated to a single score figure, while sales performance can not be <u>calculated</u> prior to the launch of a product.

There are some tools available to <u>test</u> the marketing performance of pack designs, mainly coming from FMCG (Wever, Boks, Stevels, 2006):

− 'Focus groups' is a research method consisting of a group interview with carefully selected participants from the products' target group. Focus groups have traditionally been widely used as a packaging design research methodology. It has been applied both at the start of design projects as market research and for evaluation of final designs, i.e. a form of disaster check.

   A weak point of focus groups is that it does not resemble real purchase situations very well as people do not deliberate about a product for an hour, before buying it or not, at least not with fast moving consumer goods. Hence it may be a reasonable research method for durable consumer goods, where often consumers take more time to reach a purchase decision. As stressed by Gold (2004) it is very important to at least place packaging designs next to competitor products, to improve the realism of the setting. Nevertheless, the focus groups approach does not give a numerical output; information about the packaging is generated but performance is not quantified.

− Eye-tracking

   Other methods do allow for measuring. One of these is eye-tracking. The basic idea of the test is to use equipment which is attached to a participants head to measure where (s)he is looking. When performing this test with a section of store-shelves, one can test how many consumers *look* at a certain package, how long, how often and in what order (Swope, 1981).

- Tachistoscopy (T-scope)
  Another test allowing a certain level of quantification is the Tachistoscope (T-scope). This is a method in which a participant is shown flashes of a product. Starting at for instance 1/100th of a second, exposures are incrementally increased to for instance 2 seconds. After each exposure the participants is questioned about what he saw. Hence average time scores can be obtained needed for aspects like brand recognition, product type identification and noticing special product features (Swope, 1981; Morich, 1981). Where eye-tracking determines where we *look*, the T-scope focuses on what we have actually *seen*.
  Hence T-scope is a useful tool in cases where product recognition is of the highest importance, such as medicines which may have to be used quickly in an emergency (Anon., 1993). T-scope testing has also been applied as a scientific research tool, for instance to research the effects of latency of the brain, i.e. whether placement of copy and illustration of the left or right of a package made a difference (Rettie and Brewer, 2000). Major disadvantage of this method is that its setting is very different from actual shopping environments.
- Semantic differential
  This is a method in which participants are asked to score designs on scales between two extremes, i.e. modern versus old fashioned or beautiful versus ugly (Schoormans and De Bont, 1995). In comparison to eye-tracking and T-scope, Semantic differential will measure how people *feel* about a package.

A tool combining these last three measurements would be ideal. It would give quantitative data to what extend a package is noted among its competitors, what is actually seen, and how is perceived emotionally. This would yield the data required to make well funded design choices. However, it would be rather complicated and expensive. And practicality in a business setting, where there is a limited budget, and even more important, where there is only limited time available, is of the utmost importance.

TOWARDS A TOOL
Looking from a business context it is important that:
- the tool is can be applied fast and easy,
- that the tool gives useful answers,
- that it preferably allows the testing of design concepts against existing competitor packs.

This is not an exact science searching for universal truth, but design management decision making, i.e. as a business you want something you can work with.
This means that an Internet based tool seems most suitable. It allows for a set-up testing graphical representations of pack designs (photographs of existing packs, or computer generated images of new designs) with a pool of respondents that, if sufficiently large, can be used multiple times.

Looking at the above research methods, which are available, focus groups and eye-tracking are not executable via an Internet connection to people's homes. Hence a combination of Semantic Differential and T-scope will be utilized, thus testing what people have *seen*, and how they *feel* about the designs. Added to this participants will be asked to score all packages on two scales; one for remarkability and one for attractiveness. One would expect the remarkability score to match the t-scope result and the attractiveness to match the semantic differential result. Thus a internal check is build-in. It should be understood that this is mainly an attempts to see whether these research methods will work when applied in such a way, it is not intended to claim that this is the right final tool.

This tool set-up leaves out the effects of eye-tracking, which would tell where people *look*, i.e. to test how well a pack design grabs the attention. To incorporate this effect to some extent, the T-scope will not be executed with pictures of single packs, but with a retail shelf with several products.

The goal of the T-scope is to define which product (packaging) is most remarkable on a shelf. For the test 5 flash movies were used (for an example see Figure 1), each with the same content, but with increasing length; from 250ms till 1500ms (Swope, 1981).

5 different versions of flash animations were used to provide for the fact that preferences for a certain corner of the screen/shelf may influence the results. For example; a packaging in the upper left corner has (in western-European culture) more chance to be seen than the same packaging in the lower right corner (Swope, 1981).

This test will use participants working on their own PCs in their own homes. The tool shows several pictures and asks questions to adapt itself to screen resolutions of the user. Of course different screen resolutions and other aspects of PC make that the execution of a T-scope will not be totally identical for each participant. However, this is not really a problem, as the tested design is in the same picture as the competitor products. Hence with a single participant all design stand an equal change of being spotted.

Figure 1: on the left a real retail shelf, on the right a computer generated shelf image as used in the Internet t-scope test.

The semantic differential will show people single images and ask them to score these designs on a scale with two extremes (robust vs. fragile, simple vs. complex, flashy vs. modest). Of course this type of questions allows a brand to test for attributes that are important to that specific brand, i.e. *Ideas for Life* for Panasonic, or *Sense and Simplicity* for Philips.

Basically the T-scope will yield two types of quantitative data; the percentage of people that recognized a specific brand, and the average speed with which they did so. In practice this may be more complicated then it sounds, with participants recognizing part of a brand name, or product feature. The semantic differential will yield an average score on each question asked (with a standard deviation). This data is reasonably objective (and comparable to environmental LCA data before combining different impact categories into a single score). It can be combined into a single score, even though the method of doing so would be arbitrary. From a business point of view, a single score may be more workable, and as long as it is executed consistently through time (and checked for correlation with resulting sales data or an occasional focus group), it should work fine.

Testing set-up
To test this tool it needed to be evaluated with actual packages. As a test product earplugs were selected (see again Figure 1). This type of product has several advantages:

- it is a well known unisex product
- design of the product it pretty similar across brands
- the packaging plays a major role in the sales of the product
- the price category allows for grab-and-go shopping

The test was hosted at *www.netquestionaires.nl* which allows free testing up to 100 participants. In the settings of the questionnaire it was made impossible for the respondents to redo the test, and also to stop and restart it.

Testing results
The t-scope showed 6 products at a time, so not all products were shown the same number of times in total. Table 3 shows the brand recognition from the t-scope (N=62). Here it should be noted that several times brands were named that were not in the picture the participant had just seen (e.g. Apple, Samsung, JVC).

	Sennheiser	Sony Bass Boost	Philips Extra Bass	Sony Orange	Hema Round	Bandridge	Philips Easy Wear	Lenco	Packard Bell	Hema Ear
spotted	6/62	9/11	24/30	22/24	3/11	0/54	4/7	18/43	52/62	5/51
%	9,68	81,82	80,00	91,67	27,27	0,00	57,14	41,86	83,87	9,80
ranking	**9**	**3**	**4**	**1**	**7**	**10**	**5**	**6**	**2**	**8**

Table 3: result on brand recognition from the t-scope

Table 4 shows the results of the ranking made by the participants of all 10 pack designs. This test is also used to sort out the unreliable answers. Some participants randomly filled in the test. By comparing two almost identical packages (Hema) it was estimated which participants had randomly filled in the test (for example in case they rated the one Hema package with a 1, 2 or 3 and the other Hema with a 8, 9 or 10). These respondents were omitted from the results.

		Sennheiser	Sony Bass Boost	Philips Extra Bass	Sony Orange	Hema Round	Bandridge	Philips Easy Wear	Lenco	Packard Bell	Hema Ear
remarkability	mean score	7,6	6,1	7,0	5,2	3,7	5,4	6,0	5,4	5,0	4,3
	ranking	**1**	**3**	**2**	**7**	**10**	**5**	**4**	**5**	**8**	**9**
attractiveness	mean score	6,0	6,0	5,7	5,1	5,1	6,5	5,3	5,4	5,1	4,5
	ranking	**2**	**2**	**4**	**8**	**8**	**1**	**6**	**5**	**7**	**10**
combined	ranking	**1**	**3**	**2**	**7**	**10**	**4**	**5**	**6**	**8**	**9**

Table 4: the results of the ranking question

The ranking for remarkability was expected to be similar to the ranking of the t-scope. It clearly is not. Especially the difference regarding the Sennheiser seems relevant. When ranked by participants it scores very high, probably due to its bright yellow and orange colors (see Figure 1b top left). In the t-scope however it scores very low on brand recognition.

What makes a good score on a semantic differential scale depends on what you are trying to communicate. Hence it turned out to be hard to turn these results into a ranking.

DISCUSSION AND CONCLUSIONS

This paper has shown that impulse buying is indeed a relevant factor in CE retailing, thus justifying the use of sales packaging. However, optimization is still important. From an economical and environmental perspective it is very costly to apply sales packaging (with additional material use and transport volume) to products that do not need them, or to apply them in an ineffective way.

Economical costs and environmental impact can be expressed in a single score, indicating the packs performance. To allow proper management of the pack design the sales performance should be expressed in as simple a way as possible, preferably also a single score.

As calculating the sales performance is impossible a test will need to be used. The pressure from time-to-market in the CE industry, demands that the test be relatively simple.

This paper worked towards an internet test based on the T-scope, semantic differential and ranking. The T-scope worked reasonably well under the hard to control settings of consumer PCs. Only a few of the respondents had to stop testing because the size of the images could not be matched to their screen resolution. As a measurement for brand recognition it is a good way to get a quantitative score. Next to that it gives qualitative information on which aspects of pack designs are also noticed (and how quickly). The use of a shelf picture instead of a single pack design seems a useful adaptation of normal T-scopes.

The semantic differential is hard to turn into a ranking as some a high score on a certain scale may be positive for one brand and negative for the other. For testing a specific design however, it can certainly be used.

The results from the ranking differed strongly from the t-scope results. The ranking for remarkability can be a check for the T-scope, as a striking pack with a hard to find brand name may sell fine in the store. The ranking in attractiveness can be used as a check on the semantic differential.

This combination of methods seems suitable to obtain some degree of quantification of sales performance. However, it seems wise to keep the scores for remarkability and attractiveness separate, as these aspects are clearly very different from one another.

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