Packaging design in today’s pharmaceutical industries

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I hereby declare that the work submitted is mine and that where I have made use of another’s work, I have attributed the source(s) according to the Regulations set in the Student’s Handbook.

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Abstract

This dissertation was written as part of the MSc in Strategic Product Design at the International Hellenic University.

To this dissertation we are going to research the factors that influence a “good” packaging design for medicines, such as the morphological characteristics, the sustainability and the aesthetics. Also we are going to take into consideration the graphic design of the packaging and how this influences the consumer’s behavior for a purchase.

Also, we are going to research the problems that emerge during the use of medicines, such as the facilitation of the user for taking the exact amount (dosage) of the medicine or record the times that the user has already received his dosage.

Subsequently, we are going to analyze our findings, in order to define and establish the characteristics that we should include to the design that we will propose. Finally, there will be a presentation of the design we suggest as a solution.

I would like to thank all the people that contributed for the realization of this dissertation. These are all the pharmacists that took part to the interviews and contributed with their feedback to more accurate and realistic results. Without their comments and opinions these research would be based more on theoretical level. Finally, I would like to thank my supervisor professor for his guidance and consultation during the writing of this paper.

Keywords: medicines’ packaging, design, graphics, brand identity, morphological characteristics

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## Contents

ABSTRACT ............................................................................................................................. V

CONTENTS......................................................................................................................... VII

1. INTRODUCTION ................................................................................................................. 11

   1.1 BACKGROUND ............................................................................................................. 11

   1.2 KEY WORDS AND HYPOTHESIS.................................................................................. 12

       1.2.1 Hypothesis............................................................................................................ 12

       1.2.2 Key Words .......................................................................................................... 12

   1.3 RESEARCH QUESTIONS.............................................................................................. 13

   1.4 METHODOLOGY & RESEARCH DESIGN ...................................................................... 13

       1.4.1 Methodology......................................................................................................... 13

       1.4.2 Research Design .................................................................................................. 14

   1.5 CONTRIBUTION & EXPECTED OUTCOMES ............................................................. 14

   1.6 INDICATIVE STRUCTURE OF DISSERTATION .......................................................... 15

2. LITERATURE REVIEW: PACKAGING ISSUES .............................................................. 15

   2.1 INTRODUCTION .......................................................................................................... 15

       2.1.1 What is packaging ................................................................................................ 16

   2.2 PLANNING .................................................................................................................... 17

       2.2.1 The process ......................................................................................................... 17

       Design elements ......................................................................................................... 17

       The role of packaging in logistics ............................................................................. 18

       2.2.2 Strategies for success ......................................................................................... 19

       Marketing Strategy - Using the AIDA model ............................................................. 19

       2.2.3 Today’s market trends ......................................................................................... 20

   2.3 DEVELOPING ................................................................................................................. 21

       2.3.1 Branding .............................................................................................................. 21

       2.3.2 Customers’ profiles .......................................................................................... 22

       2.3.3 Concept Development ...................................................................................... 23

   2.4 COMPLETING ............................................................................................................... 24
BIBLIOGRAPHY ........................................................................................................................................56

APPENDIX .............................................................................................................................................1

TABLE OF FIGURES ................................................................................................................................1
TABLES.....................................................................................................................................................2
1. Introduction

In this thesis we are going to examine the elements that consist a successful packaging design according to the current pharmaceutical reality. We are going to take into consideration difficulties that occur from the existing packages of medicines, and we will try to propose improved designs, that will overcome them.

1.1 Background

In our times there is a high competition to the market between the different products, in order to convince the potential customers to chose one of them. The evolution of technology has played a significant role to this. As the range of choices is increasing, because of the many options that technological evolution offers, the customers are gaining more options so the competition for the companies becomes stronger.

The two key factors of this are:
- The big variety of products that are available to the consumers, either regarding quality, design, durability and factionality or the characteristics that they offer.
- The many ways and channels, that the companies have at their disposal, in order to communicate their products.

To the above we can add the vital importance of the packaging of a product, since it constitutes a significant part of it and it can also be considered as a mean to communicate their brand to the potential customers.

Over the last few years, many companies have realised the importance of their products’ packaging design and the essential role that its different aspects can play, during the customer experience and selection of their product. The different aspects that a product’s package is consisted of are being presented and analysed below.
1.2 Key Words and hypothesis

1.2.1 Hypothesis

The purpose of this dissertation is to propose alternative packaging designs for medicines, which facilitate and help users during their experience with them. This research could be used as a basis from the today’s pharmaceutical industries so that they will improve their existing packaging designs.

The hypothesis that this research will be based on are:

- Each feature of packaging design for medicines is meant to serve a particular purpose or need and these features should apply for the larger proportion of the users. Are the features of the current medicines’ packages serve their purpose and if not what suggestions could be made in order they will?

- Even in the field of pharmaceutical products the unique design of the packaging can contribute to the positive experience of the user, so that the brand will be empowered.

1.2.2 Key Words

Packaging: All the layers that are comprised of solid materials, in order to contain, present and protect a product. Packaging design takes into account characteristics that aim to functions such as protection, handling, saving, logistics and usage of the product (Geo Raju, 2016).

Visual display: The way of the information that the brand wishes to communicate to the user, such us instructions, brand name etc, are presented to the total layers of packaging. This includes the graphics, the colors and all the tools that have been used for the communication of the information to the user.

Layers of Packaging: The different layers that the packaging is consisted of, from the point that someone sees the product until the point he uses it. These will be the outer, intermediate and inner packaging (Aradhna Krishna, 2017).
Difficulty in use: The various problems that the users face during their interaction with the package of medicines, in order to receive the necessary dose of medication.

Types of medicine: The different forms that a medicine can be received. This is the oral medicines (in this research concerns mainly the pills), the inhalant, the liquid medicines e.t.c.

1.3 Research questions

Below are the main research questions that are going to be answered in this dissertation.

1. Which are the problems that the users face during the use of medicines and are related to the packaging design?
2. Which are the factors that affect and contribute to a good packaging design for medicines?
3. Which are the key elements that should be taken into consideration during the packaging design of medicines?
4. Which is the appropriate and most effective way of visual display in medicines’ packaging?
5. Can the visual display of packaging affect the perception of the user regarding the brand and the product?
6. Eventually, would be possible the life cycle of medicines’ packaging to be extended?

1.4 Methodology & Research design

1.4.1 Methodology

In this dissertation we are going to examine the steps that should be followed, in order to discover the elements that should be used for a reliable packaging design for medicines. In order to succeed in this purpose, below are presented some steps of the methodology that we are going to follow.

- Investigation of the present studies and researches regarding the situation of current packaging of medicines.
- Create a different perception of medicines, through innovative packaging.
- Have in mind always the facilitation and protection of the user.
- Reinforce the brand.
- Get feedback for our designs from people that are in the market, i.e pharmacists, through interviews.
- Concluding to the most preferable design and refine it.

1.4.2 Research Design

The research design of this thesis is going to be based on authoritative scientific sources, that will provide us necessary information, in order to analyze all the aspects of medicines’ packaging design. Also, we are going to refer to the existing designs, so that we will be able to maintain the effective elements and evolve the ones that is necessary. Finally, the factor of the behaviour of human perception will play a significant role to the choice of our final design. For this reason, interviews with pharmacists will be contacted, which will be based on different proposed concepts of packages for medicines. The feedback that we will receive from these interviews will be used for the refinement of our final design, which will be also our suggestion.

1.5 Contribution & Expected outcomes

Even though the design of packaging, as far as medicines is concerned, is very important for practical reasons, such us safety, protection of the medical substance and facilitation of the user during the reception, most of the times these aspects overlap each other. As a result, the package ends up to offer only some of the characteristics that was iniatially designed for.

In addition, it is very important that the perception that dominates regarding medicines is not exactly possitive, because of the nature of the product. In this dissertation, we aim to design functional packaging for medicines, that could have a more extented life cycle from the ones that are offered in the market currently, for sustainability reasons. Secondarily, we will investigate if it is applicable to perceive medicines as an expedient for us to benefit our health, through the layout of the package.
So we believe that pharmaceutical industries can benefit from this study, in order to design more accessible and functional packages for their medicines and also strengthen their brand via offering a different perception of their product.

1.6 Indicative structure of dissertation

The indicative structure that we are going to follow in this dissertation will be consisted of five chapters. The first chapter will present the literature review regarding the process of designing the packaging of medicines. Also we will combine strategies of marketing and consumer behavior, related with the ways that people percept the various tools of visual display. In the second chapter, we are going to analyse the present situation of medicines’ packaging design and the problems that have been recorded during their use. Additionally, we are going to present examples of present packaging designs. Consequently, in the third chapter we are going to present alternative concepts of medicines’ packages and their characteristics, including their naming, and which will be used as framework for our interviews. In the fifth chapter, the results of the interviews will be presented and discussed. Based on these we are going to make the appropriate refinements to our final design and present it. Closing, there will be a presentation of the conclusions and the findings of this dissertation, as well as a general discussion regarding the chosen solution.

2. Literature review: Packaging issues

The main subject of this chapter will be the dysfunctional characteristics of current packaging that the companies should focus on, in order to design successful packages that will enhance their brand.

2.1 Introduction

Packaging’s purpose is to serve various functions such as to protect the product, provide easement in the storage and handling, communicate its characteristics and use. (Rundh, 2005). All these characteristics are very important to coexist harmonically in the final design and mainly fulfill their purpose.
2.1.1 What is packaging

First of all, we need to define what is packaging and from which parts is consisted of. Like this, we will ensure that we are more likely to end up with reliable findings and that we will be able to take into consideration all the necessary factors for our design. From now on, when we mention the term packaging in this thesis, we will mean the whole packaging of the product. Below are analysed the different parts of packaging.

The packaging of a product, most of the times is consisted from more than one layers. With this we mean all the layers that the consumer contacts with, until he will finally consume or use the product. In some cases, packaging is consisted only from a protective plastic or carton seal, but in most cases the external package includes also an inner package of the product. In some other cases, and also in ours (pills), the product also has an imprinted “package” such as the brand name of the company. Here, we would like to clarify that a very important aspect of the packaging is the messages that the consumers receive.
during their interaction with it, and this is the reason that we consider the imprinted brand name of a product part of the packaging. In the Figure 1 are presented the different layers of packaging as they were previously described. According to the above and taking into consideration a multi-sensory customer-product interaction, packaging appears to have two major dimensions. The physicality dimension and the fuctionality dimension. The physicality dimension refers to the way the package appears to the consumer, while the fuctional packaging refers to the purpose that serves. Also, two supplementary categories of packaging can be the purchase package, which refers to the part that affects consumers during their purchase and usually is the outer part of the package. The second is the consumption package, which refers to the part that affects the consumers during the consumption of the product and usually is the inner and the intermediate (if exists) package (Aradhna Krishna, 2017).

2.2 Planning

2.2.1 The process

Design elements

The process through which the packaging is designed is very important for the final success of the packaging design. Good planning of the procedure with unambiguous goals set, are vital elements that the industries should have in mind during planning.

First of all, according to an article of The International Journal of Logistics Management (Lockamy, 1995), from a strategic perspective the industries should determine the way that they will include to their packaging design the primary functions of packaging. Likethis, they can influence effectively the sections their brand develop competitive advantages. According to the same research packaging’s main purposes are:

- The containment
- The protection
- The apportionment
- The unitization
- The convinience
- And the communication

However, it is very important the industries to be focused and oriented in the customers’ needs in every decision they make during this process. For this to happen, is required the industries to incorporate the necessary market’s information (from the marketing department) to the strategic packaging decision process. Finaly, in order the industries to be able to end up with correct decisions, which will assist them to create packaging designs with competitive advantages, it is very important a cross-fuctional approach to be used. This approach should include:
- the analysis of the customers’ needs and the industries capabilities to accommodate that need
- the evaluation of the impact in revenues, in short term and long term timeframe, on the basis that the packaging chosen either fulfills or not the customers’ needs
- discover if the decided packaging design conforms with the overall strategy of the brand

In general, for the packaging design to offer a competitive advantage to the brand, all packaging related procedures should be examined in preference to a single task or activity (Lockamy, 1995).

The role of packaging in logistics

A very important factor that should be taken into consideration is also the transfer of the product. Packaging should be designed in order to enable the transfer of the product, in such a way that the industry can minimize its costs. The functions of packaging that are directly related to the logistics system of a company are the Containment and Protection of the product and the Apportionment and Unitization.

Containment and Protection are of vital importance for the company to ensure the good quality of their product until it reaches the final consumer. These two factors influence directly the physical condition and quality of the product (i.e damage, contamination etc) during its transfer and all the way until the final consumption.

Apportionment and Unitization are also very important and affect directly the final packaging design and the materials that it will be consisted of. These two factors
influence, positively or negatively, the transfer of large quantities and they also affect the handling transportation, the storage and the retail storage costs (Lockamy, 1995).

2.2.2 Strategies for success

Marketing Strategy - Using the AIDA model

In this section we will present and investigate the aspects of packaging that influences the communication between the product and the final consumer, from a marketing point of view.

In the field of medicines the strategic movements that an industry can proceed to from a marketing point of view, are limited, due to the nature of the product, in comparison with other fields. However, we are going to investigate how effective would be to incorporate some marketing elements to the packaging’s characteristics with final aim to influence positively the user, even subconsciously. This is because, a very important aspect that the packaging design can influence is the final opinion of the customer regarding the product.

So, we are going to use a prominent theory of communication that is being used from a wide range of businesses, the AIDA model. According to the AIDA model, the buying process that the consumers go through, consciously or subconsciously, until the form of their perception of a product follows some phases. These phases are also what AIDA stands for and are the following:

A – Attraction
I – Interest
D – Desire
A – Action

This theory model describes the four cognitive stages that every individual experiences upon a receipt of a new idea or a new product.

Attraction

In this stage the product/ packaging will get the attraction of the consumer, by its proper design and layout. In a few words, it will differentiate from the other products and will attract the consumer’s attention.
Interest
In this stage the consumer will look for the benefits and characteristics of the product and he will try to relate it to his individual needs.

Desire
In this stage the consumer will express his desire for the product, since he has decided that this product can fulfill his needs.

Action
In this final stage, the consumer will proceed to the necessary action in order to purchase the product (e.g. take the product from the self and take it to the cashier/ask for it to the pharmacy e.t.c) (Shahizan Hassan, 2015).
Now if we take into consideration this model and use it for defining some elements of packaging design, we will see that the two first stages are the ones that can be affected, in order to generate desire. Our goal is to affect the first two stages so that when the consumer reaches the third stage of the desire, to finally end up with positive perception of the product. This can be achieved through the package’s interaction with the consumer, during his whole experience with it (purchase, consumption), through the various stimulus it creates (sounds, shape, fonts etc). In general terms, the total experience of the consumer plays a vital role for his final decision, such as the salespeople, other customers and their opinion regarding the product, interaction with the brand and a lot more. However, in this thesis we are interested in the elements that can affect the design of packaging, so we are not going to penetrate to the other factors. (Aradhna Krishna, 2017)
In our case, because the consumer does not have always the option to choose his medicine, i.e. when the pharmacist suggests to him a painkiller, we intend to interview pharmacists and get feedback regarding our initial designs, which will be used in order to result to our final design.

2.2.3 Today’s market trends
The healthcare market is changing rapidly and in combination with societal changes, the pressure in pharmaceutical industry for their products to differentiate is rising.
The increase of the standard of living and life expectancy leads to consumers interest more in the retention of their health, with result people to spend more in medicines. Also, the rise of the educational level in most countries makes the customers more demanding in their choices, but at the same time, researches have indicate health illiteracy and shortage of understanding regarding the pharmaceutical products in many cases. On the other hand, eventhough there are a lot of restrictions by law in pharmaceutical industry and their products, regarding the way they will promote and offer them, this is a framework that changes rapidly. A high percentage of countries, allow the purchase of non-perscription medicines also in other stores except pharmacies but even those who have more restricted regulations are heading towards the same direction as well (Hannele Kauppinen-Räisänen, 2012).

As a result, the competition grows more and more and the need of more effective packaging becomes increasingly critical for the pharmaceutical companies to retain their advantages in the market.

2.3 Developing

2.3.1 Branding

According to an interview with Aradhna Krishna, who participated in an article published to the newspaper Journal of Retailing and was related to packaging design and its main aspects, “In the past, communications with customers were essentially monologues—companies just talked at consumers. Then, they evolved into dialogues, with customers providing feedback. Now they are becoming multidimensional conversations, with products finding their own voices and consumers responding viscerally and subconsciously to them”. (Aradhna Krishna, 2017)

As we realise, through times and changes that occur, the way that the companies manage consumers is being adopted. Today, from marketing and consumer behavior aspect, the companies are more intrested in getting feedback from the consumers for their preferences and their experience with the product. Eventhough, the healthcare industry market needs a different treatment in comparison with other types of markets, the customers’ feedback is vital for their products to stand out.
In our case, branding concerns the name and the logo that will be chosen and of course the messages that the brand will communicate through the graphic display on the package. It is very important, the brand of the product to send clear messages for the product and these messages to be in harmony with the philosophy of the company’s brand promotion. As far as medicines is concerned, it is very important the branding concept to emit reliability because targets to a very important need of the consumer, i.e. the consumer’s healthy.

In general, studies has shown that products introduced under national or well-established in peoples’ minds brand names, tend to be perceived of higher quality than a generic brand name. Also, studies that examined neurological correlation of sensation transfer pointed out that external information altered patterns of brain activation. More specifically, it was noticed higher brain activity in areas related with emotion and behavior, during the presence of a well-known brand, which identity is linked with specific emotions, than when it was absent. Supplementarily, familiarity with the brand may occur to more positive expectations from the consumers, but it is very important to bear in mind that the stronger the brand of the product the more expectations are created both to familiar as to unfamiliar consumers. (Gemma Skaczkowski, 2016).

Finally, the package’s shape and color should be coherent with the taste and texture that consumer expects to receive. However, people would be more positive to a product that differentiates from their expectations, because they will try to understand the reason for this, fact that results to even more favorability towards the product (Aradhna Krishna, 2017).

2.3.2 Customers’ profiles

The customers’ profile that the product is designed for is a very critical aspect of the research, that the companies should always have in mind during the design process. In general, during this part of the process the companies should try to understand the way that the user perceive their product during all the stages of their interaction with it. More specifically, what the users think during the use and how effectively all the characteristics and tools of communication that have been included to the packaging design take effect in practice.
Medicines are very “delicate” and “eccentric” products, as far as the communication of the product is concerned, because they are directly linked with the health of the customer. This is why it is very important the final product to inspire trust to the consumer. Vital is, of course, the role of the physician or the pharmacist for the consumer’s trust in a pharmaceutical product. According to a research (Mahmoud, 2016), even though consumers have mixed feelings regarding faith in the relationship physician-patient, branded medicines affect more positive consumers than generic medicines.

This applies because consumers may not be willing to buy cheaper alternatives of medicines due to negative quality perceptions or the reverse placebo effect. Also, effective marketing strategies of the companies of branded medicines potentially encourage the perception of inferiority of generic medicines in comparison with branded (less effective, less safe) (Eon van der Merwe Smit, 2013). Consequently, in our case, we are going to include also the brand name aspect to our design and we are going to design packaging for OTC (Over-The-Counter) medicines. To the customers profile we are going to set some prerequisites, in order to have a framework, i.e. that the package and also the medicine will be handled always from adults, even if the final recipient will be a child. That the design characteristics will not facilitate only the average user. This means that the design should be effective also for people with limited abilities such as issues of eyesight, less strength in their hands etc. Like this, the design should include, for example, characteristics that will prevent children from opening the package but at the same time should facilitate the users with limitations to use the product. We will refer to further details below, when we will analyze the specifications of our designs and the main problems that the users face during their use of medicines with the existing packaging designs.

2.3.3 Concept Development

The concept development phase, is the phase where the needs meet the design characteristics. In this phase the pharmaceutical industries, after they have examined the needs that they consumers seek to fulfill, they choose the characteristics that their designs should include and they proceed to the concepts generation.
In our case, for the design of pharmaceutical packaging, it is very important to have as a general guideline for their concepts. The “five rights” of medicines use. These should be taken into consideration in order to conclude to the final elements of the designs so that the outcome to be successful. These are: the right patient, right drug, right dose, right route and right time (James Ward, 2010). This means that the final characteristics of the packaging’s design will have to facilitate the right user (e.g. adults and not children), so that he will be able to receive easily, the right dose of his specific medicine, in the right time.

After the concepts have been generated, it is very important the concepts that were chosen as the most appropriate for production to be tested from real users. This is a very important part of the procedure because the industries will have the opportunity to refine their designs, taking into account feedback directly from the source, i.e. their clients, in order to reduce time and costs and eventually increase the possibility of their product’s success.

2.4 Completing

2.4.1 Optical Visualization

Visual display of the package is a very important aspect of the package’s design because this is the first stimulus that the consumer gets in contact with during his experience with the product.

Firstly, it is very important to increase the visual salience of the product through the display of the product’s package, by using unique visual and verbal cues for the communication of the product with the user. According to Journal of Retailing, when there is a considerably contrast in the colors, brightness, size, shape, texture, or smell, between the background and some other element, then the detail appears salient. As a result, the visual display attracts more easily someone’s attention. The same applies also with packages shaped differently from their surroundings (Aradhna Krishna, 2017).

Graphical positioning is a very important part of this procedure. A visual cue of a product’s image is possible to create expectations to the user and make him more receptive to other potentially available information. Also, consumers tend to prefer
more strong brands when the logo is placed in a higher part of the package rather than when it is placed in a lower one (Aradhna Krishna, 2017).

Furthermore, the user’s perceptual process is a very important factor for the way that the visual message will be interpreted. For this reason, during the design, the focus of the message should be exclusively to the receiver and main target be the objectivity and the ease of reading. Also, it has noticed that visual messages and especially in combination with text tend to be the best solution as far as the understanding of a message is concerned. For example in the communication of the instructions. However, the visual representations should be brief and direct and be placed in the appropriate background in order the appropriate contrast is ensured. (Gabriel H.C. Bonfim, 2015)

2.4.2 Morphology/Colours

Visual comprehension is also a very important aspect of the layout of the medicine. According to research, only the 18% of the people questioned read the instructions when they use an unfamiliar product. This means that the design of the package should be intuitive and accessible to the user. For this reason, simplicity of the shape is a secure way to ensure the previous mentioned characteristics. So it is very important to have in mind that the packaging design is based on the principles of Human factors and Ergonomics, since the aim is to facilitate the user. (Gabriel H.C. Bonfim, 2015)

2.4.3 Selection of the materials

Sustainability is also an aspect that the pharmaceutical companies take into consideration these days. With this, we mean the use of materials for the development of medicines with equal medical value and adequate packaging specifications, but with the less possible environmental impact.

Environmental friendly packaging design, offers a lot of options to the companies and are related, as much, to the materials and the lines of the product’s package, as to package’s functions and texture. At the same time, it is a very important asset, not only as far as the positive environmental impact is concerned, but also as the consumer’s perception regarding the brand name of the company. Nowadays, the majority of the packages used are made mainly from plastic and different types of carton. However,
the two main materials that are used, mostly for the inner layer of packaging of tablets, is the PVC blister and the aluminium blister packaging. According to the life cycle assessment of a research, the PVC blister packaging seems to be more environmental friendly, in comparison to aluminium blister packaging, in the most of the environmental impact categories that were taken into account in the research. For example, in the case of aluminium blisters packaging, the global warming potential is 70% more in comparison with the one of PVC blisters, while, aluminum blister packaging consumes 63% more energy during all of its life cycle than PVC’s (Geo Raju, 2016).

The selection of the materials during the design process, is based on many different factors such as the properties and the performance of the material, the total cost and the environmental impact of the material during its life-cycle. Regarding the environmental impact of the materials, a LCIA (Life Cycle Impact Assessment) can be made, which is an extensive list of inputs (resources) and outputs (airborne, waterborne and solid emissions) of the material. On the other hand, there are a lot of cases that because of the different methods used during LCIA a comparison of two different types of plastic cannot be made. For example, even though PVC is highly recommended, as far as its environmental impact is concerned, according to the EPS method of LCIA, on the other hand, according to the EDIP method it is the one with the worst environmental behavior. However, it is very important a sensitivity analysis among different LCIA methods to be conducted before the final material selection, in order to include the sustainability aspect to the final result (M.D. Bovea, 2006).

3. Methodology: Packaging design for medicines

Medicines are related essentially and directly with people’s health and their perception of it. So the preservation of their high quality and the communication of their effectiveness, in order to offer the sense of security are very important. Packaging design is a key factor for these factors.
3.1 Types of medicines

The most frequent types of medicines are the syrups, the tablets/pills and the effervescent tablets. The last two are the most popular in the category of pills with a wide range of action (painkillers), which are also the ones that we are going to use to this thesis.

According to a research that was published to the International Journal of Pharmaceutics, a common problem used to oral medicines is that the pill is stuck on the receiver’s throat. This phenomenon appeared in smaller rate during the use of coated tablets with diameter ranging between 0.5-1.0 cm, even though, a percentage of receivers’ of coated tablets with diameter of more than 1.5 cm experienced the same problem. (Kim Notenboom, 2017). Also, the compliance of the consumer with the dose of medicine is a very important factor for the medicine to be effective and is one of the sectors that consumers seems to face difficulties with during their interaction with the medicine. The compliance is depended on several factors like the information that the pharmacists give to the consumers but the main is the inflow of the necessary information to the consumer (Rees, 1992). To this a solution can be given through an intuitive packaging design.

3.2 Packaging

3.2.1 Difficulties that the users face with the existing packaging

A very significant aspect that we should include to our research, is the needs that packaging design of medication characteristics is meant to serve. By this, we mean the safety requirements that should fulfill and at the same time the facilitation of the user. This means that we should take into consideration, for example, a child-resistant mechanism and how this relates with the patient during the use. Also, the age and the abilities of the user are elements of significant importance, which we should also be included to our research. A research regarding the difficulties that, mainly elder users face during their reception of medication (pills), has shown that the child-resistant mechanism constitutes one of the main problems during the use. As a result, most of the times, they end up to substitute the original package with others, easier in open-
ing, for the storage of the pills, or leave the bottle almost open, so that they won’t have to deactivate the mechanism in their next use. In both cases, the mechanism for child-resistance is permanently deactivated and loses its purpose.

Furthermore, the same research, indicated that most of the users face difficulties regarding the information they receive regarding the medicine and the steps that they will have to follow in order to open the package. The visual information that the package gives them, most of the times is not enough or clearly stated, and there are a lot of cases that users confuse medicines with similar packaging, due to this deficient information. As we can realize, the aspect of efficient labeling and visual display of the necessary information are also of vital importance to the procedure of pharmaceutical packaging design (James Ward, 2010).

3.2.2 Intelligent Packaging

As the technological evolutional evolves, the industries try to find constantly ways to evolve their products and their packaging solutions. Intelligent packaging refers to the integration of technological discoveries, like artificial intelligence, process of information, materials science, engineering and electronics, optics, printing etc., in the packaging in order its functions to be more efficient (Shouliang, 2013).

In a lot of cases, intelligent packaging is used in pharmaceuticals in order to facilitate user to manage his medication at home, especially in case of chronic diseases. There are examples that use smart technology, e.g. the package is connected with an application, which helps consumer monitor his dose and give him a statistical overview for his activity (e.g. forgetting to take a dose or a dose that has been already taken etc.) (Z. Pang, 2014).

3.3 Labeling

The design of the label is also a key point of the branding of the medicine, but practically is linked directly also with the safe use of medicines. There are a lot of cases that the same manufacturers use in general the same aesthetics in their labels and packages for different types of medicines, without taking into account the unique characteristics that labeling requires for each medicine (Diana Maria de Almeida Lopes, 2012).
According to the National Health Surveillance Agency (ANVISA), medical error is defined as a preventable incident that can possibly or realistically lead to inappropriate use of medicine and that can potentially harm the patient. This can be related to many factors such as human practice, the use of product, labeling, packaging and more (Diana Maria de Almeida Lopes, 2012). This topic can be further explored but at this point we are going to focus for our research on the potential errors that can be occurred and prevented from the labeling factor.

In cases of medical errors like confusion of the medicine that should be received, the 25% of them has been imputed to orthographic (look-alike) and phonetic (sound-alike) resemblance of medicines names and packaging (Lynne M. Emmerton, 2012). In general, the naming procedure is complicated and requires a lot of time, in order the industry to pass all the required stages, which are the submission of the chemical entity and patent application, the generic and the brand naming, the FDA review and ultimately get the final approval. For this reason, the industries pursue to eliminate the time of this procedure and in combination with the fact that FDA does not require the integration of human factor standards, in most cases industries result to pay no attention to the human factor aspect during the name selection. Human factors concept is very important because the possibility of human error is a reality and this is a fact that should be measured during the naming and labeling procedure, in order medical errors will be avoided (Kenagy JW, 2001). Severe incidents have occurred due to the resemblance of names’ layout on the label was used, i.e. the same color and their top cover looked alike in terms of size, shape and color. Additionally, data analysis of research has shown that lot of cases in which no attention was paid to medicine’s naming and have led in generating namings with spelling or phonological resemblance justify, more or less, the 25% of medical errors’ incidents (Diana Maria de Almeida Lopes, 2012).

After exploration regarding optimization of labeling design in Denmark, it was suggested, in order to increase ligibility, font contrasts to be created in the layout of packagings. This seems to operates possessively in an international level. Regarding the uniqueness of the medicines’ names, according to psycholinguistics, the longer the name of the medicine the bigger is the risk of confusion, but the shorter names have greater chances to be similar with the already existing ones. Finally, the uniqueness
can be reinforced by placing the distinct syllable at the start or the middle of the medicine’s name (Lynne M. Emmerton, 2012).

3.3.1 Problems & Solutions

An essential aspect that packaging design can directly influence is the drug application or the way that the consumer will receive his medicine, especially when the package has functional characteristics. In many cases, a medicine of the appropriate active ingredient, with a successful combination of the appropriate packaging and the correct delivery system is the key to success, both for the pharmaceutical industries and the consumers (Sam, 2003).

Child resistant mechanism in medicines’ package is a controversial characteristic that in many cases ends up to prevent the consumer from receiving the medicine. This mechanism was introduced, in order to reduce the unintentional poisonings of children and researches has shown that the number has been, indeed, drastically reduced. The target was the development of safety closures, so that it will be significantly difficult for children under five years old to open the package but not difficult for the average adults to use it appropriately. Like this, the current types of packaging that recognized as child resistant are based on the prerequisite of ISO 8317, 2004. However, these types of design exclude or disturb a big portion of the consumers from the use of medicines, particularly the elderly which is more common to have physical functional limitations, people with disabilities such as the visually impaired or with low hand strength (Laura Bix J. d., 2009). For example, researches has shown that the 70% of patients that is required to follow long-term treatment with anti-rheumatic medicines are unable to open correctly child resistant packages (Rees, 1992).

3.4 Examples of medicine’s packaging design

Below are presented the solutions that are offered from the pharmaceutical industries as far as the packaging of pills is concerned.

The first offered solution is the package that is consisted of a bottle in different sizes and contains the pills. Usually, they are made of either plastic with no safety
mechanism (figure 2) or glass and include child resistant mechanism. There is no separation of the pills inside the package and the consumer can extract the medicine after opening the bottle, simply by leaning the bottle forward to his hand.

![Figure 2: Package of pill medicine in a plastic bottle, Source: ttp://www.plasticprogress.com/](image1)

![Figure 3: Package of pill medicine in a glass child resistant bottle, Source: https://www.domingo-printing.com/](image2)

The second solution is the pills to be offered in a blister package, which will be enclosed in a carton package. Here, the different sizes of the pills are enclosed in a blister which is consisted either from PVC (figure 7) or aluminium (figure 5). In case of PVC blisters the consumer is able to see the exact form and color of the pill because the cover from the top side is transparent (figure 4). The consumer in order to extract the medicine will have to press from the one side of the blister on the top of the pill and it will come out from the other side of the blister. Usually, these types of packaging include an extra outer layer of packaging from carton, in a rectangular shape, that contains and protects the blisters and also enables their transfer (figure 4).
Finally, in the figures 8 and 9 are presented two typical packages that are used from the consumers or even sold separately from the pharmacists for storage of the pills or for the separation of their daily dose. The one in figure 8 is used mostly for distinguishing the pills and the dose that the consumer should receive daily, while the one in figure 9 helps the consumer to have easy access to the medicine and a small sized and practical package. Both of them are made of plastic and can be refilled, but none of them includes any kind of protective seal for the medicine.
4. Data Analysis: Medicine’s packaging design concept

In this chapter we are going to present the concepts that we developed and that will be presented to the pharmacists, during the interviews, in order to extract information that we will use for our final design.

4.1 Development of the concept

Packaging of medicines are a unique category and needs special attention in the characteristics that will be included to the designs. This happens because of the perception of the users regarding the product and because of the strict legislation towards the promotion and the safety rules that the product and the package must comply with. Below is presented the process for the conception of the ideas in order to conclude to the three concepts used.

4.1.2 The conception of the idea

In order to be able to evaluate and integrate the different notions and ideas we used a mind map. A more organized version, which shows the philosophy that each concept was based on, is presented below. This mind map shows the initial features that we intended to include to our designs as also the way that we translated these so that they will become specific characteristics that we could integrate to the designs.
Figure 10: Mind map-Step 1

Figure 11: Mind map-Step 2
4.2 The concepts

Here we are going to present the concepts, their characteristics and the reasons that each one of them was chosen. All of them have been designed in the common bases that the package will be consisted of recyclable materials and will introduce an alternative perceptive to the user. Finally, in order to be able to receive feedback for wide range of characteristics regarding packaging design and for the characteristics that people consider important during the interviews, we chose to design three completely different concepts.

Concept 1: Hapi-ness

With this concept we wanted to test an alternative presentation of medicines to the consumers. Considering that consumers perceive medicines as something that is not pleasant because they use it when they are in pain, we created a concept which is characterized from joyful colors and lines and that promotes health through visual messages. Like this, we wanted to invoke pleasant feelings to the consumer.

Figure 12: Concept 1 Hapi-ness
However, as long as people to be healthy should follow a healthy life style, e.g. healthy food habits but because of the particular nature of the medicines there is a limitation in the promotion of use of painkillers. For this reason, we designed a packaging that will promote healthy lifestyle and habits through visual messages that will be placed to the inner package of the medicine. With this design characteristic, we wanted to encourage the users for a better way of living, fact that may seem against the aim of high sales of pharmaceutical companies, but that it could operate positive to the perception of the user from the brand’s establishing aspect, because it can create the feeling of care in the consumers. Finally, this can promote the responsible use of medicines, which can contribute subconsciously, also, to the positive perception of the user towards medicines for the same reason.

Additionally, because we wanted the package also be easy in use and at the same time fulfill the safety requirements we designed separate boxes that will be air tightly closed until they will be opened, for the consumption of the pill. The additional advantage of this separation is that these separate boxes, will divide the pills in portions. This means that the consumer will not have to use a scissors, in order to carry a pill and also will not have to contact directly the pill until the time he intends to consume it. Finally, the sealed boxes prevent the easy opening of the medicine from kids, and at the same time protect the substance of the pill.

Concept 2: The Green pill

The basic research of this paper is ways that packaging can be more useful, after the end of its content (i.e. the pills in our case). Like this, through the initial proposed concepts we wanted to present alternative packages that will have longer life cycle, in terms of usage, with all the benefits that this can offer either to the company or to the consumer.

With this concept, we wanted to gain feedback regarding the idea of refillable packages of medicines. This is a practice that applies to a lot of countries in the world, even though that it has not yet introduced to the Greek pharmaceutical market. By adding this characteristic to our design, we give the opportunity to the consumer to buy a medicine with lower price and to the company to sell it with increased profit, particularly the replacement part of the medicine. The philosophy of this concept is based on
re-usage of the package and has an eco-friendly character. At the same time we took into consideration factors that are related with ergonomics, safety and easiness in use even for people with lower capabilities.

As you can see in Figure 3, the consumer can easily export the pill by opening the cup and using the buttons in the side of the package device. With this design, we avoid the child resistant packaging mechanism that is used in current packages and does not work for a big portion of the consumers. However, with the combination of the specifically designed cup and the fact that the user should press the buttons in order to ex-
port the pill, we avoid the easy access of children in the pills. To this design, we have used coated tablets with 1 cm diameter, because according to research findings, coated tablets with diameter between 0.5-1 cm are easier to ingest from the user, so they facilitate the reception of the medicine. Also, 1 cm diameter, and not smaller size, was chosen because the size of the tablet should at the same time facilitates the holding of the medicine during the reception, also to people with lower kinetic capability (Kim Notenboom, 2017). Furthermore, big importance has been given to the role of protection and transfer of the medicine. So, the package designed to be small, light-weighted and the pills to be covered from a specific protective seal that will be cut when the user presses the two buttons, in order the use will be facilitated. Furthermore, with this mechanism the user will have the ability to receive the medicine without necessarily his hands will contact the medicine, which eliminates the transfer of microbes. Additionally, the package can be easily transferred from the user, while its size is a little bigger than a pen and it is light-weighted. Finally, the user can easily place vertical the replacement part to the package device and re-use it.

Concept 3: Pausiponous

With the third concept we wanted to test the perception of the users regarding safety and preservation of the medicine, and of course regarding the easiness of the package in use. This is the reason that in this design we used simple lines and characteristics and we did not include an inner protective seal for the pills. This package can also be refilled or, alternatively, after the use of its content can be used as a storage box for little things or even other medicines. The purpose of this was due to the fact that, according to research a lot of consumers end up to store their medicines in alternative containers because they consider the original one too complex or difficult in use (mainly we refer to the opening of the package) (James Ward, 2010). For the same reason, most of the pharmacies offer to their patients various kinds of containers, of the same philosophy of the third design, so that they will store their pills, instead of using the original package of the medicine.
As you can see in figure 4, the package of concept 3 opens by simply pulling the two sides of the box towards the opposite direction and then the consumer can collect his pill from the inner tank. For safety reasons, the outer part of the packaging has a safety clip that needs to be opened before pulling the two sides. Finally, in the design of the inner part has been added a protective surface in order to prevent the pills to accidentally fall out, during the opening.
4.2.1 Brand name/ Typography

Concept 1: Hapi-ness

For the first concept we chose the name hapi-ness, which is consisted of the Greek word “hapi” (Χάπι) that means pill, and plays with the word happiness that stands for the feeling of joy. This name was chosen because of the philosophy that the whole concept was based on. This is to give a pleasant perception of the medicines, because this will function as a vehicle for the consumer to feel released from the pain (e.g. headache) and obtain the feeling of joy again. However, because we did not want to promote the idea that medicines should be received in order to make the consumer feel happy, we integrated to the concept visual cues that promote health through different ways, such us a daily balanced diet. With this way we wanted to separate the medicines from the feeling of happiness and promote the appropriate use of medicines. Like this, we integrated this notion to the logo of the medicine, by using two unambiguous and different colors to the two parts of the word, even though the spelling of the word happiness is different. So the name will be easy to the user to remember it, it will reminds the “hapi” (i.e. the pill) and also it will predispose consumer to positive feelings. Finally, the logo was used in order to test how acceptable would be from the consumers the idea of a more positive presentation of the medicines.

Figure 15: Concept 1 Logo
Concept 2: The Green pill

The logo of the Concept 2, followed the philosophy of its concept, which involved the idea of re-usage and environmental friendly medicine. For this reason, we chose to name this concept “green” and subsequently the medicine, so its name ended “The green pill”. We used a naming which is clear and points directly to the environmental character of the concept’s philosophy, by using the green colour that is linked with the environment in people’s minds. Also, we used a simple naming that shows its identity, in order to test the perception and the importance of the medicines’ name in consumers’ minds and how likely is to remember it the next time they will buy a painkiller. Finally, we used serious and clear lines to the design of the logo, in order to create the sense of reliability regarding the product to the consumer’s mind.

Concept 3: Pausiponous

In this concept we chose a name that plays with the two Greek words “Pausi” (Παύση), which means pause, and “Ponos” (Πόνος), which means pain. These two words are the two synthetics of the Greek word “Pausipono” (Παυσίπονο), which means painkiller. We made that choice because we wanted to create a direct link of the product with the name to the consumers’ minds. This concept was created, in order to test the characteristics that people consider important to a medicine’s package and the same philosophy we followed to the creation of its logo. Taking into account, that most painkillers offer the same effect to the consumer, we wanted the naming of this con-
cept to be harmonious and directly linked with the effect of the medicine in the consumers’ minds. Subsequently, we used two colors (purple and blue) that are related in the color palette, in order to relate the two meanings of the words “Pausi” and “Ponos” and talk directly to the consumer about the effect of the medicine, i.e. the discontinuance of the pain. Finally, we used as visual cue a staircase that shows downtrend movement, in order to predispose the consumers subconsciously for the mitigation of the pain.

4.2.3 Visibility/ Materials

The materials that was planned to be used for all three concepts are environmental friendly, but at the same time it is essential to meet some requirements, in order to be appropriate for usage in packaging of medicines. This means that the materials used should have a certain degree of endurance, so that the protection and preservation of the medicine is ensured during all the stages of its usage (i.e. transfer, state before the opening of the consumer, state during the opening of the user, prevention from opening the package underage people). For this reason, although we used the less possible material to our packaging designs and embedded elements that allow and promote the reuse of the package, the main material used is different types of recyclable plastic and carton. With this way, we took advantage of some characteristics of the plastic like the endurance, flexibility in shapes and low production costs, but at the same time we used types of plastic that can be recycled so that we will minimize the environmental impact. Of course, in order the research to be complete, it should be also investigated the emissions of harmful substances during the production of the types of plastic that will be used, although it will be recyclable. However, we will not infiltrate more in this
section to this dissertation but it is an aspect that it would be important future re-
searches to take into consideration.

5. Discussion and Final concept

In this chapter, we are going to discuss the feedback that we received from the inter-
views with the pharmacists regarding the previous developed concepts and their brand
names. We chose the pharmacists because they are in contact directly with the medi-
cines, but also with the consumers in daily basis. Consequently, we are going to pre-
sent the refinements that occurred from the interviews’ conclusions and also our final
design.

5.1 The interviews

5.1.1 The framework of the interviews

During our interviews with pharmacists, we used the previous presented packaging
designs in order to give them a visual image of them. We chose random pharmacies of
different scale size and locations and posed questions regarding the following topics.
- Which pills consumers prefer most? (between two dominant brands in the Greek
market that their tablet has a different diameter and shape)?
- Do the consumers remember names or colors of the medicines?
- What do you think that consumers would think of the reusable packages?
- What do you think for a medicine that promotes a more joyful/ playful concept?
- Which of the three concepts (the package) do you consider that would be the most
successful and why?
- Which logo do you consider that it would be the most successful and why?
- General opinion/ feedback regarding the packages and the logos

In the end of our research we interviewed 25 pharmacists of different backgrounds
and ages in the region of Thessaloniki and of which the results we are presented be-
low.
5.1.2 Results of the interviews

Below are presented the results of the interviews and the feedback we received regarding the previous presented concepts. During the interviews we guided the pharmacists using specific questions like the ones we reported above, in order to extract targeted information for our topic. However, we gave them also the freedom to express any other opinion and thought outside of this framework, in order to collect data from all the points of view for the subject.

Between the three concepts, the package of the concept “The green pill”, seems to be the most successful to the eyes of the interviewees (figure 18), even though the logo of the concept “Pausiponous” appeared to be the more attractive (figure 19), as far as the naming and the optical visualization is concerned. The package of “The green pill” was selected by the majority of interviewees (n=18), because in general they considered that its design makes it more convenient and functional and at the same time it was considered an asset that a protective seal is included. The logo of “Pausiponous’, likewise, was selected also from the most interviewees (n=16), mostly because of its name and layout.

The concept of “Hapi-ness’, even though that it was second in their preferences, produced controversial comments regarding the fact if encouraging messages should be displayed to the medicines’ packages. The same applied also for its logo, although it came also second to the preferences of the interviewees.

As far as the package of the “Pausiponous” concept and the logo of “The green pill” is concerned, turned to be the last on their preferences. The package was characterized simple in use and lot of pharmacists recognized similar packages that they sell to their consumers separately for their medicines. Also, a lot of them reported complains of their consumers that this type of opening is not easy in use in cases of elder people. Also the lack of protective seal was a noticeable disadvantage for this concept.

Below are showed the comments and observations that we collected during the interviews, while also are presented possible reasons for each of them. Also we present the percentage of preference for each concept and its logo, while also the answers we received in the targeted questions we used during the interviews.
As you can see, even though the respondents preferred the package of the Green Pill, the majority of them also preferred the name and the logo of Pausiponous. We have to take into account that the interviews were conducted to the Greek market and the naming of the Concept A and C use wordplays with Greek words. This can explain that in most cases, people justified the choice of Pausiponous with reasons such as “the name is easy to pronounce and says exactly what the medicine does, the pause of pain” and “I like that the name is understandable and simple because I can remember it”.

![Figure 18: Graphic Representation of the preference between packages](image18)

![Figure 19: Graphic Representation of the preference between logos](image19)

Also, as it arises from the interviews, very important for the consumers is firstly, the medicine to be covered and protected from external factors (84%) and secondly, the total numbers of pills that a package contains (92%). The practicality and the small size of the package seems to be also a very significant feature, since the 88% reported it as essential. Finally, despite the fact that refillable packages in medicines have not introduced in the Greek market, the 80% was positive to this idea. All the results of the answers are presented gathered in figure 20.
Finally, a very important aspect that we wanted to investigate through this research was the perception of people regarding a layout that would promote health and positive feelings (figure 21). Here the answers were divided because there were people that enjoyed the idea and some of them also said that they would accept a similar concept to medicines for kids. On the other hand, there were also people that were totally negative with this perspective and disapprove it. Almost the one third had neutral opinion regarding the matter though and thought that it is not an important factor.
**Concept 1 – Hapi-ness**

<table>
<thead>
<tr>
<th>Comment</th>
<th>Possible reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is ok the layout of the medicine’s package to promote joy and happiness (n=2)</td>
<td>The responders clarified that they personally prefer in general products that promote joy and that they consider it a positive characteristic for a product like medicines.</td>
</tr>
<tr>
<td>It reminds me of a package of gums</td>
<td>Probably because of its layout</td>
</tr>
<tr>
<td>It is too cute/childlike for a medicine’s package</td>
<td>Probably because of its shape and layout</td>
</tr>
<tr>
<td>Encouraging in medicines is negative and we should avoid it to its packaging (n=2)</td>
<td>The responder clarified that it considers it unethical because the high use of medicines should not be promoted</td>
</tr>
<tr>
<td>It contains less number of pills and so it is more expensive (n=5)</td>
<td>The responder explained us that the consumers consider an important factor the final cost, in relation with the number of pills they will buy</td>
</tr>
<tr>
<td>It would do as a package for children’s medicine</td>
<td>Because of the colors and the shapes of the design</td>
</tr>
<tr>
<td>It does not have something important/original</td>
<td>The responder evaluated it in comparison with the concept 2</td>
</tr>
<tr>
<td>I like the package’s aesthetics and practicality</td>
<td></td>
</tr>
<tr>
<td>It seems to me that its package is more complicated in use</td>
<td>The responder referred mainly to the opening of the package</td>
</tr>
<tr>
<td>It logo seems to me that is easier to remember</td>
<td>Mainly because of the naming</td>
</tr>
<tr>
<td>I do not like its logo because it looks alike with the word happiness</td>
<td>The responder related the name with the word happiness and he explained that medicines are not related with this feeling. On the contrary, people relate medicines more with pain and the appears strange</td>
</tr>
</tbody>
</table>

Table 1: The outside structure feedback we received during the interviews regarding Concept 1
**Concept 2 – The green pill**

<table>
<thead>
<tr>
<th>Comment</th>
<th>Possible reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that elderly people will not be able to use it easily</td>
<td>Because there is not a similar package for medicines in the Greek market. The responder also pointed that elderly people a lot of times encounter problems with the understanding of the packages’ opening and they result back to the pharmacy for clarifications</td>
</tr>
<tr>
<td>I think it is more easy in usage (n=2)</td>
<td></td>
</tr>
<tr>
<td>Most people prefer the medicine to be covered with a protective seal (n=3)</td>
<td></td>
</tr>
<tr>
<td>I do not think that it will be convenient for the users in the Greek market</td>
<td></td>
</tr>
<tr>
<td>I like that the pill comes out one at a time</td>
<td></td>
</tr>
<tr>
<td>Young people do not prefer the pills to be completely exposed, so this design is a good solution (concept B)</td>
<td>Young people are more informed and with the quality of life rising they have higher standards, especially for their health.</td>
</tr>
<tr>
<td>It seems more interesting in me as a package</td>
<td>In comparison with the alternative 2 concepts</td>
</tr>
<tr>
<td>I like its logo because it reminds me of sustainability</td>
<td></td>
</tr>
<tr>
<td>Its logo reminds me the name of a superhero</td>
<td></td>
</tr>
<tr>
<td>I do not like it because it reminds me of the blue pill (n=11)</td>
<td>The responders related negatively the naming of the medicine with another very popular medicine with different effect.</td>
</tr>
</tbody>
</table>

Table 2: The outside structure feedback we received during the interviews regarding Concept 2
### Concept 3 – Pausiponous

<table>
<thead>
<tr>
<th>Comment</th>
<th>Possible reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>It does not open easily and it is not convenient when you want to take out the pill</td>
<td>Because the pill are not divided in the package</td>
</tr>
<tr>
<td>It reminds me a package of candies</td>
<td></td>
</tr>
<tr>
<td>It seems more practical to me</td>
<td>Because of the way of opening</td>
</tr>
<tr>
<td>I think that it is more convenient if you want to take it with you</td>
<td>Because of its shape</td>
</tr>
<tr>
<td>I think it is a problem that the pills does not have protective seal</td>
<td></td>
</tr>
<tr>
<td>It is easy the pills to get lost</td>
<td>Because the pill are not divided in the package</td>
</tr>
<tr>
<td>I do not think that this package suits for elderly people</td>
<td>Because of the way of opening. The responder explained that he has accepted complaints for packages with similar openings, mainly from elderly people</td>
</tr>
<tr>
<td>It is small and it does not takes a lot of space</td>
<td>Because of its shape and size</td>
</tr>
<tr>
<td>I like the play with these specific words to its logo</td>
<td></td>
</tr>
<tr>
<td>I would choose this one because of its naming</td>
<td></td>
</tr>
<tr>
<td>From my experience, the more practical and funny is the name of the medicine, the more easily the consumers remember them</td>
<td></td>
</tr>
<tr>
<td>We see that in most cases the medicines that its name play with words do not bring high sales</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: The outside structure feedback we received during the interviews regarding Concept 3

Furthermore, the pharmacists pointed out that according to the feedback that they receive during their daily association with the customers, important factors for the preference of the consumers are:
- The opening of the package to be easy
- The price of the medicine to be low, which is an aspect that should be taken into consideration also during the design of the package, because it adds cost in the final offered price of the product.
- It is negative the brand to change its package shape, colors and aesthetics because the consumer gets confused and feels that he buys a different medicine. This has more to do, probably with the feeling of security that consumer needs to feel towards medicines since it is a product that effects directly a very important aspect of his body, his health.
- The big size either of the package or of the pill effect negatively the consumers and also the pharmacists. This happens because the bigger the package, the more difficult makes the handling, storage and transfer of the medicine for both sides. The pill affects mostly the consumers because it is more difficult during ingestion.
- The consumers tend to prefer packages that include higher amount of pills, in most case because of the lower cost, regardless if the medicine is a pill or an effervescent tablet. However, when they need a medicine with rapid effect they will prefer an effervescent tablet.
- As far as the layout of the package is concerned, the majority of consumers remembers mostly colors of the medicine they want to buy. The recall of the medicine’s name depends on the age of the consumer and on the nature of the name, excluding the leading brands of the market that have been already established.
- The majority of the interviewees thinks that people would be positive in the idea of a package that could be refilled, especially if this could decrease also the cost of the medicine.
- Between the two leaders in painkillers, that offer their medicine in form of pill and also in effervescent tablet, people seem that preferred the pill medicine of the A company more than the B. This probably happens because the A company offer its pill in round shape of less than 1 cm diameter, while the B company offers it in rectangular rounded shape of approximately 1,5 cm diameter.
- Consumers tend to remember most of all the color of the pill.
5.2 The final concept

5.2.1 Refinement

After the discussion of our findings during the interviews and the literature review of other researches, we proceeded in some refinements to the concept B that resulted as the most preferable during the interviews, before we present our final design of packaging for medicines. As we previously mentioned, the shape and the practicality of the package is one of the most important factors. For this reason our design has the smallest possible size and its form is consisted of simple and clear lines. In order to avoid the current design of children resistance but not to sacrifice the important factor of safety, we designed a cap that closes air tightly only by pressing because of the round shape in the inner part of the cap (figure 23). Also, because very important is the design to be intuitive, we placed a different finish in the top of the cap in order the consumer to understand which is the side of the opening when he holds it (figure 23). Additionally, because as occurred from the interviews, the number of pills is also a very important factor we decided to increase the number of pills that our package includes in 14 pieces per package. The mechanism for the export of the pill, which consists an extra safety for the export of the pill, remained as it was originally planned for this concept and requires to press at the same time the two side buttons. The design concerns pill of 1 cm diameter as it was planned, because based on the researches is the most suitable size for the facilitation of swallowing and at the same time for handling the pill. Finally, the material that we planned to use during the construction of this design is recyclable plastic, harder type for the device and softer type for the protective seal.

As far as the logo is concerned, we suggest the one of concept C, since this had the most positive response during the interviews. We kept the original layout and the color palette and we removed the staircase. We resulted to this change, because based on the interviews’ results, simple and comprehensible names tend to perceived more positive from the consumers, as far as medicines is concerned.

This dissertation was based on the hypothesis that each characteristic of the package should serve a specific need, something that in a lot of cases does not happen as we previously analyzed. Also, unique designs of packaging can empower the brand of a
company also in pharmaceutical industry. Based on these hypothesis we suggest this
design of layout and packaging design for medicines.

5.2.2 The final design- Logo & Packaging (Photorealistic photos)

![Figure 22: The connection part](image1)

![Figure 23: The cap](image2)

In figure 22 is presented the connection of the storage part of the package with the
cap and in figure 23 the design of the cap that allows the air tight close. Also in figure
23 is presented the intuitive design that allows to the user to perceive through touch
which is the top part of the package. The material used for the ball in the inner part of
the cap is rubber in order to have better application and close with the bottom part,
due to the properties of the material.
In Figures 24 and 25 is presented the way that the consumer will place the replacement part and the spare part with the protective seal which it can be offered separately.

For the two side buttons that will use the consumer for the export of the pill we used also rubber in order to improve the feeling during the use (figure 26). Furthermore, the bottom part was designed so that the package can be placed easily to a surface and an anti-slip strip was added in order to improve also the feeling of the user and the stability of the package (figure 27). Finally, in figure 28 is presented the final packaging design in a realistic way and its dimensions are presented in comparison with an average cup, in order to show the relation of its size to another object.
6. Conclusions

In the beginning of this dissertation we set some questions that we were going to investigate. First of all, we explored and analyzed the problems the consumers meet during their use of the current packages of medicines, including the reasons that they occur. We also searched deeper to these reasons in order to frame the factors that affect a good packaging design for medicines and extract from them the key elements that we should integrate to our designs. Additionally, we imported the factor of the package’s visual display and which are the elements that should be consisted of, in order to predispose the consumer positive. The naming was of course a very important aspect.
Finally, we tested alternative layouts, in comparison with the current ones, and ways that we could extend the life-cycle of the package (refilling, re-use).

The conclusions of this research is that the packaging of pharmaceuticals that is offered at present in most cases does not facilitate the user. The problems that were recorded occur due to the fact that the design of the package is oriented to the function and not to the user and human ergonomics. The most important factor, and simultaneously, the key element that should be taken into account in the future designs, is the human orientated design. Every feature’s main target is to be functional and facilitate the user and this is what should eventually do.

Moreover, if sustainability will be integrated to the pharmaceutical industries packaging designs is able to give them an important asset regarding their product and improve their brand position to the consumers’ perception. A way for this could be the extension of their package life cycle, which will benefit at the same time the environment and the companies. Our suggestion here is the reuse and refill of the package.

Furthermore, the results showed that the layout and the choice of visual elements, affects the perception of the medicine more than the naming, and in combination with a good active substance and functional features can be the key to success. A good combination of visual cues and colors that promote reliability can have better impact to the consumers’ perception, but their perception of the brand will prevail to the naming of the medicine.

Finally, our suggestion of packaging design for medicines includes all the above aspects and can be used in practice, since this solution has already been partially tested through the interviews. Of course further tests of the package constructed could provide more accurately results and we would encourage them before the final production, but this thesis offers a complete design solution that a company could be based on.
Bibliography


Appendix

Table of figures

Figure 1: Examples of the layered-packaging taxonomy: physicality and functionality dimensions, Source: Aradhna Krishna, 2017 ................................................................. 16
Figure 2 :Package of pill medicine in a plastic bottle, Source: http://www.plasticprogress.com/ ........................................................................................................ 31
Figure 3 :Package of pill medicine in a glass child resistant bottle, Source:https://www.domino-printing.com/ ................................................................. 31
Figure 4: Package of pills in PVC blisters, Source: https://gr.pinterest.com/pin/ ............ 32
Figure 5: Package of pills in aluminium blisters, Source: https://www.indiamart.com/ . 32
Figure 6: Outer package of pills in blisters, Source: https://dir.indiamart.com/ .......... 32
Figure 7: Package of pills in PVC blisters, Source: http://adrenalina.co/ ................. 32
Figure 8: Package of pills improvised box of storage sold by pharmacists, Source: https://www.livestrong.com/ ................................................................. 33
Figure 9: Package of pills improvised box of storage, Source: http://www.parentingnh.com/ .................................................................................................. 33
Figure 10: Mind map-Step 1 ....................................................................................... 34
Figure 11: Mind map-Step 2 ....................................................................................... 34
Figure 12: Concept 1 Happiness ............................................................................. 35
Figure 13: Concept 2 The green pill ........................................................................ 37
Figure 14 Concept 3: Pausiponous ....................................................................... 39
Figure 15: Concept 1 Logo ..................................................................................... 40
Figure 16 Concept 2: Logo ..................................................................................... 41
Figure 17 Concept 3: Pausiponous ....................................................................... 42
Figure 18: Graphic Representation of the preference between packages .............. 45
Figure 19: Graphic Representation of the preference between logos ...................... 45
Figure 20: Graphic Representation of the answers of the structured questions during the interviews ......................................................................................... 46
Figure 21: Graphic Representation regarding an alternative presentation of medicines 46
Figure 22: The connection part ................................................................. 52
Figure 23: The cap .................................................................................. 52
Figure 24: The way of refilling ................................................................. 53
Figure 25: Replacement part .................................................................. 53
Figure 26: The package refilled ............................................................... 53
Figure 27: The bottom part of the packaging with gripper .................... 53
Figure 28: Presentation of the final design packaging ............................ 54

*Figures that do not include a source, are product of my own unaided work.

Tables

Table 1: The outside structure feedback we received during the interviews regarding Concept 1 .............................................................................. 47
Table 2: The outside structure feedback we received during the interviews regarding Concept 2 .............................................................................. 48
Table 3: The outside structure feedback we received during the interviews regarding Concept 3 .............................................................................. 49