CREATING A PLEASURABLE ALUMINIUM PACKAGING

Bachelor degree project in Product Design Engineering
Level G2E 22,5 ECTS
Spring term 2015

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Assurance of own work

This project report has on 25/11/2015 been submitted by Celia García Cobo and José Campillo Navarro to University of Skövde as a part in obtaining credits on basic level G2E within Product Design Engineering.

We hereby confirm that for all the material included in this report which is not our own, we have reported a source and that we have not – for obtaining credits – included any material that we have earlier obtained credits for within our academic studies.

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Abstract

This project has been carried out in collaboration with CC Pack, a Swedish packaging company located in Tibro, and under the supervision of University of Skövde.

The aim of the project is the creation of a new aluminium packaging, with the intention of satisfying the highest number of customers’ requirements, getting also a differentiation from the competitors.

Archer’s model is followed during the design process. This model allows strengthening the efficiency of project design.

The compilation of information in order to make a complete requirement classification is based on: CC Pack requirements, a study of customer needs focused on interviews and pilot study, and a literature study lead by Maslow’s hierarchy translated to design along with the 4 pleasures of Patrick Jordan.

After the requirements classification, it is time to start with the concept generation phase. This phase consist of diverse methods of generation and evaluation of ideas, such as brainstorming or the weighted objective method, until a final solution is reached.

This last solution, which consists of an aluminium tray surrounded by a cardboard structure, is communicated at the end of the project through illustrations created through design software such as PTC Creo Parametric and Photoshop.

Conclusions obtained are quite positive in general, nevertheless there is still an aspect that could be improved. It is related to the shipping system and it is commented in chapter 7 conclusions.

There is also a chapter devoted to propose possible future contributions in order to implement this project.
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1 Introduction

Product design, both graphically and physically, has become an essential competitive tool, as strategic value, for products that must survive in a globalised and competitive environment, while efficiency within packaging design has been a secondary target among enterprises. Today, the designer's role and product design has become especially relevant, due to the clients’ increasing enquiry for variety in products. This implicates more competition among products of the same type (Referenceforbusiness.com, 2015).

Packaging becomes an essential part of the process that helps to move sales from the manufacturer to the customer. Its function has a very wide extension, reaching from the protection of the product to the costumer's satisfaction. The packaging and the product make up an indivisible unit based on two main elements: functionality and marketing (Kleimenova, 2015). Although the product is functional, it has to convince customers to buy the product in a short time. So packaging is the most important way to catch the customer attention, but it also can be responsible to make or break product sales. As a persuasion element in the purchase decision, packaging has to be well interconnected with the targeted consumer.
The manufacturer has to take into account the perception, preferences, wishes, and cultural environment of the customer, to be able to design the packaging correctly (Koutsimanis et al., 2012).

1.1 Collaborators

This project has been carried out in collaboration with CC Pack. CC Pack is a packaging company from Tibro, Sweden. It manufactures packaging mainly for the European food industry. CC Pack has provided useful information related to materials, manufacturing process, and competitors.

CC Pack is a big company with 3-shift production. The company mainly produce pressed board (57%), although they also produce a considerable amount of erected board (25%) and aluminium (18%). In 2014 the company generated sales of 12 million euros and exported 50% of its production (Ccpack.se, 2015).

Some of their products are show in Figure 1.1:
CC Pack supplies their clients with packaging that is destined to the food industry and foodservice sector. The company sells its products to large and medium sized companies in Europe like:

The company detected that from all its products, the aluminium trays were outdated. They observed that none of the competitors were providing products more innovative than theirs. CC Pack saw an opportunity to differentiate from the competition, with its aluminium packaging, and keep maintaining its leadership in this sector. That is the reason why they decided to improve this issue.
1.2 Precedent

Sales strategies have been changing equally with the demands of the costumers. Nowadays it is not only the content, but also the design of the packaging what catches the attention of the costumer. So, the aesthetic and structure of each packaging is necessary to detail. This is the reason why since the 1980s the involvement of both graphic and industrial designers in the industrial development of products has increased (O’Rourke & Williamson, 2000).

Globalisation is also responsible for the importance that packaging has nowadays. A wide range of products of the same type, from anywhere in the world can be found in a supermarket, this is due to globalization. Globalization has led to that the competition is much bigger around the world than few years ago. It is one of the reasons why packaging’s design has become more and more important, because it may be the first step to differentiate from the competitors (Neary, 2003).

Although good packaging does not guarantee success, it is a good way to increase the sales. It is because packaging may be the first thing that the customer sees and it may be the only thing that represents the company in the customer’s eyes (Paine, 1991). So depending on what the packaging conveys to the clients, they may pay attention to this product or not. Many of quality products have failed in the market due to poor packaging. A good example for that is the case of Tropicana orange juice. Tropicana did a failure change of their orange juice packaging. In 2009, PepsiCo, owners of Tropicana, introduced a new look. Instead of an orange skewered with a straw, the new Tropicana Pure Premium OJ carton centred on a photo of juice (Glantz Design, 2015).

![Tropicana orange juice packaging](Figure 1.3: Tropicana orange juice packaging before (left) and after (right) the change (Glantz Design, 2015).)

Due to that change, Tropicana lost more than $30 million due to two main reasons:

- People did not recognize the product.
- New design looks like a generic or discount store brand.
The reasons why this packaging seems more generic are as follows:

After changing the packaging, the brand name "Tropicana" loses importance in the composition in the corporative elements of the graphic design. Firstly because the brand is no longer in the centre, but in a lateral of the packaging. Secondly because of the change in size and type of the font. Reducing the size of the font and changing it to a less ornamental one makes that the packaging draws less attention. And third because of the new orientation of the brand. By putting the word vertically the brand is less readable, and it is not the first thing you read.

All these changes make that the word does not draws the consumer's attention in the new packaging. On the contrary, the information “100% orange” does it. Usually it is the brand of the packaging what draws the most attention; therefore the clients see it as a generic or a discount store brand.

1.3 Problem description

In order to define the problem accurately, the analysis of the study will focus on the design optimization of the aluminium cardboard trays, which is the aluminium packaging shown in Figure 1.4:

By the time the project started, it was clear that there were a multitude of packaging with original, innovative and attractive designs. Several web pages were checked to avoid repetitions and plagiarism. These pages are (Packaging of the World - Creative Package Design Gallery, n.d.), (Wee, n.d.), (Friedman, 2008) and many others. In these web pages, which showed the top rated packaging in different ranges of design; it was found that the percentage of aluminium packaging that appeared in them was very low. The conclusion was that there were not many aluminium packaging highly rated regarding the design in the market.
Despite this fact, the option of working with any other material was not possible since the main aim of CC Pack was to improve the aluminium packaging. Aluminium is a material that has the capacity to work on temperatures between -200º C and 350º C (Cpack.se, 2015). This makes it an ideal material for food packaging since they have to be in a freezer for their preservation and then be heated in microwaves or ovens.

### 1.4 Aim

As can be seen in Figure 1.4, the packaging has two different parts, the aluminium tray and the cardboard lid. The project mainly consists on designing the primary packaging, that is to say, a packaging that is in direct contact with the product (Packaging terminology, 2015). Both the aluminium tray and the lid are part of this packaging, and the goal is to get an original design, which fulfils as many customers’ requirements as possible.

CC Pack allows almost every possible change. New materials, forms, colours, textures, etc. are welcome as long as all of these changes adapt to CC Pack’s machinery without forgetting that the main tray must be aluminium.

A secondary packaging could also be designed, that is to say, a packaging that contains one or more primaries, and whose function is to protect them (Packaging terminology, 2015).

In order to frame the design problem in a more specific way, the Performance Specification Method (Cross, 2000) has been used. Despite of the fact that this method’s main intention is creating clear and precise specifications, it can also be helpful at the time of describing the problem. Because its first purpose is stipulate the level of generality of the specification, in order to make clear what creation or changes could be made to solve this problem. Depending on this level of generality, the designer will have more or less degree of freedom to design.

The Performance Specification Method introduces the following rating to state the different levels of generality:

- **Product alternatives.**
- **Product types.**
- **Product features.**

In this project, the designer's level of freedom would be set after applying this method to the problem given by CC Pack;

- **Product alternatives:** in this case there are no choices for this level, since CC Pack determined that the solution must be an aluminium tray packaging.
- **Product types:** this is the level where the designer should start from in this project. The solution is going to be a new product, so several product’s aspects such as shape, colour, width, size and so on, can be
decided by the designer. A good way to start with this level would be thinking on which kind of food is going to be inside of the packaging.

- Product features: as it can be imagine, if the second level of generality is open to changes the third level will be as well. So the designer can establish the rest of characteristics and details belonging to this level.

After the designer’s level of freedom is known and before starting with the literature survey, a brief list of attributes could be written. In this case, the preliminary attributes would be:

- Eco-friendly product.
- Easy opening (manually).
- Aluminium tray.
- Safety use.
- Producible with CC Pack’s machines.

Specify what type of edible the final product will carry. Since the material used is aluminium, it has been settled that only precooked meals will be handled. In view of the fact, that there are more suitable materials to hold fresh comestibles. Even so, within the precooked meals, the one which this project will focus on should be stipulated. Would it be meat, fish, pasta, vegetables, desserts…?

In fact, working on the principle that CC Pack inflicted no restriction, there are no specific reasons to opt for one or the other. Bearing in mind, that the fact of focusing only in one type of food will ease and allow clearer, stronger and more accurate solutions, which is one of CC Pack's goal.

Regardless, in this case fish has been chosen as main ingredient to be worked with. This decision has been approved by CC Pack without a problem, who also expressed that once a solution for fish packaging was determined, if needed, the same appearance could be applied to different future clients products.

This final design has to be pleasurable in a competitive market sector, as the packaging sector is. To accomplish that, the product should satisfy as many customers’ preferences as possible. Achieving that, the final product could differentiate from the competitors.
2 Design strategy

This chapter describes the phases that the project goes through in the development process.

A design model is the way of representation of the process developed by the designer. Cross classifies the design models into two groups: descriptive and prescriptive. The aim of these models is to enhance the efficiency of the design (Cross, 2000).

The descriptive models show the sequence of activities that occur in design. An example of this design model is the French model. On the other hand, the prescriptive models prescribe a pattern of design activities. These models, in addition to describing, they give guidelines to develop each of the phases and stages of the design process. An example of this type of model is March's model or Archer's model (Cross, 2000).

Finally a prescriptive model was chosen, in specific, Archer's model of the design process (Cross, 2000).

This model was chosen because it is aimed at obtaining logical specification from the design problem, although it looks like the conventional process. At the same time, this model entails the creation of several design alternatives in sketches, in order to assess them and make the right decision (Cross, 2000).

This method is divided in three phases, as Figure 2.1 shows:

![Figure 2.1: Phases of Archer's model of the design process (Modified from Cross, 2000).](image)
This model includes interactions with the world outside of the design process itself, such as inputs from the client, the designer’s training and experience. The output is the communication of a specific solution. These inputs and outputs are shown in **Figure 2.2** as external to the design process in the flow diagram which also features many feedback loops.

**Figure 2.2:** Archer’s model of the design process *(Modified from Cross, 2000).*

The steps to follow in this project are:

- Programming
  Clarify the main goal in order to decide how to work.
- Data collection
  Collect, classify and analyse.
- Analysis
  Identify sub-problems; perform a requirement list.
- Synthesis
  Prepare outline design proposals (sketches).
- Development
  Develop design alternative(s).
- Communication
  Show the product to possible clients.
3 Background

Following Archer's model, the next step to carry out is the data collection. In that section all the information needed for the project will be collected, classified and analysed before starting with the development phase.

3.1 Competitors

Designing new products requires understanding the use of current products. To familiarize with the market, the already existing aluminium packaging has been studied through CC Pack competitors. That study helps to identify the advantages and disadvantages of each product, giving the opportunity to find a gap in the market. Some of the biggest competitors are presented in the following sections.

3.1.1 Advantapack

Advantapack is one of the largest European packaging companies, located in United Kingdom. This company specialises in aluminium foil trays, with more than 100 different aluminium packaging in its portfolio. Advantapack considers itself as the new leader in packaging, with a variety of shapes and sizes that are unique to the packaging industry. But most of their products make reference to the basic geometric shapes. In Figure 3.1 are what Advantapack shows, in its webpage, as special aluminium packaging (ADVANTA, n.d.).

![Figure 3.1: Aluminium cardboard trays of Advantapack (ADVANTA, n.d.).](image)

3.1.2 Constantia Aloform

Constantia Aloform is a packaging producer, which belongs to a big group with more than 80 companies. It is located in Germany (Cflex.com, n.d.). It is an important competitor due to its competence and its large experience. But its most important value is the technology that this company uses. Constantia Aloform works with more than 15 ways to produce packaging, so they could create an extensive selection of packaging geometries. The range of products includes the designs seen in Figure 3.2.
3.1.3 CONTITALi2r

I2r is another packaging company, whose production is focused on aluminium foil packaging used throughout the food industry (I2rps.com, 2015). I2r's main advantage is their aluminium printer; they produce aluminium trays with many different designs. I2r's weak point is the forms they produce, as Advantapack, their products make reference to the basic geometric shapes. Some of their products are shown in Figure 3.3:

![Figure 3.3: Aluminium cardboard trays of I2R (I2rps.com, 2015).](image)

After this search, the strengths and weaknesses of competitors are known, as well as their common products. Having gathered and analysed this information, it is easier to find a way to produce a different and more sophisticated design, one that will distinguish the company from its competitors and that will therefore make them gain competitive advantage.
3.2 Customer need study

The best way to obtain the information needed is developing a plan to identify customer needs. Primary research will be used to collect the data required to orientate the design team about the most important aspects for customers related to packaging. Primary data consist of first-hand information. It can involve questionnaires, surveys or interviews (Kotler & Amstromg, 2014). In this case the method used will be the interview.

3.2.1 Interviews, as tool to know future client’s preferences

A product cannot be designed just with a preconceived idea. However, it is necessary to validate the clients’ preferences through interviews, previous studies that can provide relevant information, observations, or other methods in order to prevent failure. A way of knowing the clients’ exact conception is through an interview, since interviews provide in-depth information pertaining to participants’ experiences and viewpoints of a particular topic (Turner, 2010).

Designing packaging is a difficult process where preferences and demands have to be discovered and developed in order to assure the success of the packaging on the market. Thomas Edison said: "Genius is one percentage inspiration and ninety-nine percentage perspiration." (Saw, 2012, page 1). In the design process, as in any other, work and dedications are key elements to succeed. Therefore the products’ success is dependent on careful planning and production (Saw, 2012).

The interview that provided the data to be aware of the clients’ needs, purchase moment valuations, habits, buying power and so on was performed in Skövde, in a supermarket called Willys. This supermarket was selected due to its geographic location. Willys is in downtown, which means that many different people can be found in it every time. All people selected had a supermarket bag which meant that they had been directly in contact with food packaging. This fact supposes that people’s answer will be more realistic and reliable.

40 persons, 20 women and 20 men, were randomly selected for an interview about the packaging influence on their shopping. The purpose of the interview was to know what the packaging transmits to clients. It is important to guide the project to a good design solution. The questionnaire and results can be found on Appendix 1.
After the completion of this questionnaire, the conclusions obtained are the following:

- Most people spend less than 5 seconds in front of the supermarket shelf.
- Most people choose the most attractive packaging for each one, when they are going to buy a new product. However, they also read the product’s information after choosing it.
- The best way to show the food that the product contains, for customers, is using a transparent surface accompanied by detailed information.
- The most attractive packaging property is the graphic design, followed by the form. Size is the less important property for the choice.
- Most people consider that packaging influences the perception of quality at the first view.
- Good balance between price and brand is a big advantage to increase the sales. Due to people give a lot of importance to the price, but at the same time they want the best product possible.
- Almost everybody pay attention to the respect for the environment of the product.

3.2.2 Consumer emotions caused by package design

After obtaining the results and conclusions from interviews, it would be convenient to strengthen the customer study. To complement this section, a previous study about the emotions caused by the design of the packaging on consumers, which was performed by Martin Maguire at Loughborough University in 2003, is analyzed (McDonagh, 2004). With the information gathered from this report is disclosed as consumers feel when interacting with containers. Its most important conclusions are:

- Good packaging can help people to maintain their self-esteem and dignity. Clients are going to feel good with the packaging if it has a comfortable use. For example, if someone cannot open the product he could feel stupid and his level of encouragement decreases.
- Users hand strength is often adequate to open the packaging but sometimes it is not possible due to the product semantics and surface features.
- Food packaging can have a positive or negative affect on a person’s feelings.

Finally all collected data will be represented in the packaging through the form, colour, symbols, structure and texture. This fact allows a good communication between packaging and customer (McDonagh, 2004).

3.3 Literature Study

Having carried out a research, among academic books, in order to find a good pattern to follow in the design process, different theories and schemes were found as Kansei Engineering (Nagamachi, 2011) and Page’s method (Jones, 1992). But finally Maslow hierarchy is chosen. Maslow formulates in his theory a
hierarchy about human needs. He argues that as the most basic needs are satisfied (lower part of the pyramid), the human being develops needs and wishes of superior levels of the pyramid (Maslow, 1970).

The main reason because this hierarchy is chosen is because Maslow’s Hierarchy is exclusively addressed to help humans to reach a pleasant mood (Maslow, 1970). This is what this project is really looking for, creating a product beyond its primary features, being able to accomplish most of customers’ requirements. Maslow claims that a product must complete the basic necessities before becoming pleasant, according to functionality and usefulness (Hjelle & Ziegler, 1981).

The original hierarchy of needs of Maslow’s Hierarchy are divided in 5 levels, looks like Figure 3.4.

![ MASLOW'S HIERARCHY OF NEEDS](image)

**Figure 3.4:** Maslow’s hierarchy of needs (Research History, 2012).

Although Maslow’s hierarchy was not created to help the design process, there already are several ways to translate Maslow’s hierarchy to design. The most common one is shown in Figure 3.5.
Maslow's hierarchy translated to design is interesting to lead this project. Each level of this hierarchy will be explain succinctly:

- **Functionality**
  Above all, a design must be functional. If the design cannot fulfil these functions, the design will fail. Nowadays any design is expected to meet with these basic functionality needs; however this is not considered anything special. Moreover, those designs that meet only basic functionality needs are considered to be of little value.

- **Reliability**
  Once the design meets functional needs, it can rise up to the second level. In this level the design should offer stable and consistent performance. The product not only should work, but work continuously.

- **Usability**
  In this level, it is supposed that the design will work consistently. But now the question is the following: Can users figure out how to use it?

- **Proficiency**
  When the design is considered as proficient, this design is considered as a high level one. These designs are the ones that allow the users to do things that were not possible previously.
Creativity. When a design meets the creative needs, this design is considered to be of the highest level. These designs can interact with people in innovative ways. And the most important in this level is that the design generates a loyal fan base.

After knowing the Maslow classification about the levels that a design can reach, lost design goals start to be directed. But the research continues since the clearest design goals are wanted. Knowing that the project aims to design a packaging, a new path is opened.

The most adequate translation from Maslow’s hierarchy to the packaging’s design was found in Patrick Jordan’s book, “Designing Pleasurable Products”. This translation indicates the instructions to follow in order to achieve the pleasure of the consumer needs. In that book, Maslow’s hierarchy describes human beings as a wanting animal. Maslow affirms that human beings are never satisfied because if a pleasure is reached, other desires are going to appear to take the previous one place (Jordan, 2003). The adaptation to design of hierarchy of consumer needs has three levels, which are:

- Level 1. Functionality
- Level 2. Usability → Each level is developed later.
- Level 3. Pleasure

Levels are only available if the previous one is fulfilled. So, once levels 1 and 2 are fulfilled, it will be time to start with the last one, which looks for the pleasurable aspects of the product. Pleasure is a wide term, which includes a lot of aspects. For that reason, characteristics related to pleasure will be divided into the 4 pleasures that Patrick Jordan describes in his book. These are physio-pleasures, socio-pleasures, psycho-pleasures and ideo-pleasures. Below it can be read a brief description of each kind of pleasure, taken from (Jordan, 2003).

- Physio-pleasure. Pleasures derived from the sensory organs, connected with touch, taste and smell as well as feelings of sensual pleasure. Physio-pleasure applied to a material product would have relation with tactile, eyesight and olfactory properties. Physio-pleasure will help to achieve a good interaction, between product and consumer, during the product’s use.

- Socio-pleasure. Pleasures derived from relationships with other people. It means relationships with friends, colleagues or like-minded people. Socio-pleasure could help to solve problems related to discrimination or racism, creating common interests and activities for example. This is something that a packaging cannot do directly, but it can drive to situations where different people share their time. For example, workers of the same company could spend the lunchtime together if they bring their meals to work. In this case, this product could be the reason why you eat with other persons instead of alone at home.
Psycho-pleasures. Pleasures derived from the emotional responses that people have because of what the products transmit them. This kind of pleasures is difficult to control because it depends on each human's mind. In this case, psycho-pleasure is destined to bring good feeling to consumers when they meet the product.

Ideo-pleasures. In the context of product, these pleasures would relate to the product’s aesthetic. Values and beliefs would also be included in this section. Idealism is located on the top of Maslow’s hierarchy, it means that ideo-pleasure is the last step to achieve a pleasurable product and it also means that previous desires have been reached.

3.3.1 Level 1 - Functionality.

It is clear that if some product does not fulfil the functions necessary to carry out the objectives for which it has been created it won’t be useful. So before thinking on the usability, the product must be functional. Material and manufacturing has to be studied to achieve the desired functionality (Jordan, 2003).

Material and manufacturing.

The main objective of this project implies that aluminium foil is the material that should be used. So here it is not necessary to either perform an information search or compare different materials. CC Pack has its own aluminium foil, so coatings and lacquers do not have to be studied.

Aluminium foil containers bring many advantages to the food packaging market. This packaging is qualified as the “perfect package” for numerous food-packaging applications. Among these advantages are (Aluminium foil containers, 2012):

- Aluminium foil can withstand wide temperature changes (between -200ºC and 350ºC) better than other packaging materials; it can go from freezer to oven to the dinner table without changing containers.
- Only aluminium food containers can be safely used in all ovens—regular ovens (including broiling), toaster ovens and microwave ovens.
- Aluminium foil containers are leak-resistant and keep foods fresher whether in the refrigerator or in the freezer.
- Aluminium is ductile and malleable. It can adopt almost every desired shape. These features make aluminium foil suitable to embossing.
- Low density, making it a lightweight metal.
- Resistant to corrosion.
- Protects light sensitive products.
- Non-absorbent.
- Easy to clean and sterilise.
- Non-magnetic, making it easy to separate from other metals.
- Can be 100% recycled at relatively low cost.
Aluminium foil can be combined with other materials such as coatings, paperboards, inks and plastic films, for most of packaging applications. If foil is to be printed, it is recommended to print a matt background to ensure a major visibility and give it a wash coat to provide a foundation for the ink (Emblem & Emblem, 2012).

Due to all of its beneficial features aluminium use is widespread throughout the packaging industry, particularly with respect to ready-cooked food consumers.

There are aluminium foils with different values in thickness. According to the thickness the aluminium trays are classified in (European-aluminium.eu, 2015):
  - Flexible (<50µm), like wraps, push-through packs, bottlenecks...
  - Semi-flexible (50 to 200µm), like containers, trays...
  - Rigid (>200µm), like cans, aerosols...

In this case, the election has been an aluminium foil of 200 µm in thickness. The cause of this choice is simple; the creation of a semi-flexible aluminium tray is desired. This foil almost behaves like a rigid aluminium packaging, keeping the possibility of being blend, and reducing crash damages (Emblem & Emblem, 2012).

### 3.3.2 Level 2 - Usability.

Once functionality has been achieved, people want products that are easy to use. Nowadays, almost every product is in this situation because people are used to functionality products, but now they also expect usability (Jordan, 2003).

“Usability is a, related but complementary, concept that defines the quality of the interaction between people and systems. If ergonomics and human-centred design are the means to create products that fit people, usability is how we measure the fit” (van Kuijk, van Driel & van Eijkc, 2015, page 309). So ergonomics and user-centred design are important terms to take into account on that level, usability could be achieved through those elements.

**Ergonomics and human factors**

Ergonomics and human factors are different terms with the same meaning, which must be present in this level in order to achieve the desire usability. Both are known as the scientific discipline in charge of interactions among humans and the element of a system in order to guarantee a pleasant relationship.

Ergonomics must be taken into account when a new product is going to be designed. Years ago, this fact meant a products added value. But nowadays, with the social evolution, ergonomics has become a common feature of every product (Jordan, 2003). For example, customers now expect products to be easy to use. For that reason, usability has moved from a source of pleasure to a basic skill. Otherwise, if the product is not usable customers will be unpleasantly surprised by difficulty in use.
Ergonomics helps to solve usability problems and increases product functionality, for that reason, ergonomic and design, can be the key for the growth of product’s productivity and its commercialisation (Jordan, 2003).

Human factors have been winning importance until obtaining a relevant position in the design process for most of industrial designers. But it has not always been the case. Fifteen to twenty years ago, human factors had less importance on the design process, since people was not as much familiarized with them as today (Jordan, 2003).

3.3.3 Level 3 - Pleasure.

At this point the client's perception truly gains importance, in view of the fact that depending on how the following factors are used, the client's first impression might be one or another. It should be noted that it is also here where the four Jordan Pleasures would be affected. Given that, regardless of that the physio-pleasures are more related with the functionality and the usability of the product, it is the product's final physical appearance that directly influences the psycho-pleasures, ideo-pleasures and even the socio-pleasures.

The main roles are performed by the psycho-pleasures and the ideo-pleasures since both are closely bound among them, therefore both can be said to rely on what the client might perceive at first sight. For that very reason, factors such as the colour, the typography, the images and other visual aspects are to be taken care of to achieve the desirable reaction.

On the other hand, the socio-pleasures may be vicariously influenced by the ideo-pleasures, given that what each individual's opinion is about the product could bring along common opinions or emotions even among different people. Hence, it would be affecting whomsoever's social aspects of those who participate in this conversation.

As mentioned above, it must be taken into consideration that the consumers are not satisfied only if the product is functional. If the product fulfills its function properly, a new necessity will be created soon. That is why the emotional part of design must be studied. Now it is time to consider communicative and aesthetic factors such as colours, images, typefaces and so on (Jordan, 2003).

Packaging through communication, environment and functionality influences the purchasing behaviour, where graphic design makes reference to the communicative aspect (Arslanagić, Peštek & Kadić-Maglajlić, 2014).

Graphics design in packaging has a triple function; it offers product identification, it behaves as persuasive element for customers and it informs about product features.

“At the moment of buying, vision is the most important modality, but during the usage the other sensory modalities gain importance” (Fenko, Schifferstein & Hekkert, 2010, page 34). That is a really important statement because it can be
supposed that people will buy a product if its appearance is striking. But, at the same time, it can be supposed that people will not buy that product again if they did not consider that the product fulfilled their needs.

Packaging communication factors are very important to create an interactive communication channel between producers and customers. To achieve this communication, persuasive design attributes could be used on different packaging.

Persuasion consists in understanding the emotions that affect people's behaviour and act on those emotions to design compelling user interaction. “Persuasive design applies psychological principles of influence, decision-making in a consumer context, engagement strategy, and social psychology to every stage of the design process, and it identifies potential barriers and emotional triggers to elicit the desired actions” (Del Galdo, 2011, page 1).

In order to know the packaging graphic world, it is necessary to analyse the elements that take part on the graphic design. These elements are in Figure 3.6: some of them, such as form or size are related to physio-pleasures. While, as it can be read below, image, colour or typeface could be included in psycho-pleasures due to how they affect the clients’ emotional responses.

\[\text{Figure 3.6: Communicative elements (Modified from Auttarapong, 2012).}\]

**Colour**

“According to researchers, colour visuals increase the willingness to read by 80% and can positively affect motivation and participation to the same degree” (Green, 1989). “Colour also accounts for 60% of acceptance or rejection of an object, making it a critical factor in the success of any visual presentation” (Walker, 1993, page 1).

The product’s colour influences the perception on it. That is the reason why colour is extensively used in marketing. Colour is usually the first product skill that attracts at consumers (McDonagh, 2004).

Once the importance of considering colours was clear, the followings statements were taken into account:
- Dark range of greens and blues can give the impression of antiquity. These colours are used to transmit sophisticated and consolidated quality (Cao, 2015).

- Combination between white and pastels colours transmits purity sensation, transparency, clarity, delicacy and sensitivity (Paterson, 2004).

- Complementary colours combination provokes attractive and striking designs. They are often used for products destined to young audience, due to the high visual impact of complementary colours combinations (Obliandaet al., 2010).

- Saturation also provokes consumer’s sensations. Low-saturated colour packaging is associated to expensive products, while high-saturated packaging is associated to cheapness or low quality (Becker et al., 2011).

- A highly saturated, as opposed to a lowly saturated, packaging colour will lead consumers to experience the product taste as more intense (Becker et al., 2011).

Another important fact is the relationship between the shape and colour of the packaging. This relationship is shown in **Figure 3.7**.

![Figure 3.7: Connection between shape and colour](Modified from Becker, et al., 2011).

**Typeface**

Writing types have emerged to communicate diverse visual qualities. Currently, a lot of options exist to reach the requested aspect. Traditional typeface offers both bold and thick style. But nowadays, thanks to computers, these writing types can
be modified to form new visual stimulus.

Depending on the market share the product is addressed, the use of one kind of font is more suitable than others. For mass-market products is more convenient to use simple letters to ensure that shoppers can read them from across the supermarket aisle. Otherwise, if the product is going to be head to the up-market, the type treatment is not so restricted by legibility issues, so a more artistic style can be used (McDonagh, 2004).

**Images**

Packaging pictures drive the clients’ willingness to try the product. More specifically it supposes the 59% of that willingness (Piqueras-Fiszman et al., 2013). That information shows the importance that pictures have on packaging.

*“Images evoke both conscious and subconscious emotional responses, while colours and typeface evoke primarily conscious ones”* (Liao et al., 2015, page 53).

Packaging pictures, representing the food in different fashions, impacts consumer expectation for packaged prepared food’s naturalness (Labbé, Pineau & Martin, 2012). A case study published in “Food packaging and preference journal”, discloses that the term attractive was among the most elicited term for those packaging with photo, while not for those with text (Piqueras-Fiszman et al., 2013).

According as design and print methods were evolving, artists began to create images with specific characteristics. Thereby images could be changed depending on the public they were directed to. As result of that, visual language was developed.

Otherwise, there is a good alternative to present the product instead of a picture. That alternative consists of showing the food that the product contains through a transparent material, that option was what possible customer wanted in the previous poll.

**Life Cycle and environment**

Conclusions from the first survey suggest that people also consider the respect for the environment as an important product characteristic. Which means that creating an eco-friendly product, client’s satisfaction could increase. This reason drove to include the following section, about recyclability and environment, in level 3.

In the modern eco-society, the demand for recoverable and recyclable products is growing really fast. Clients ask for an increasingly efficient use of natural resources. This applies also to the packaging sector. Aluminium’s recyclability supposes an added value for the packaging since people are getting more aware of environmental issues (European-aluminium.eu, 2015).
Aluminium can be recycled at relative low cost. Recycling aluminium process consumes about 5% of the energy required to refine the original ore. Aluminium packaging needs to be separated from other packaging materials when intended for material recycling, but aluminium is non-metallic, so it can easily be separated from other metals (Emblem & Emblem, 2012).

Moreover this material will keep being well appreciated like material for design due to aluminium will in 2025 be a key enabler of Europe’s transition to sustainability and will respond to tomorrow’s societal needs (European-aluminium.eu, 2015).

3.4 Survey regarding customer preferences of product’s aesthetic features

Once the factors in level 3 get analysed, a second survey is done to reinforce the information obtained. This survey is done with the main purpose of getting to know the customer preferences towards the attracting skills of the product specially its shape and colour.

70 people, 35 men and 35 women, were randomly selected for this survey. All of them were over the age of 18, among which there were teachers from a school in Fuengirola (Malaga), clients from Bedmar Supermarket (Jaén) and exchange students from Gothenburg.

The results obtained from this study are graphically shown in Appendix 2, while the conclusions are shown below.

Clients prefer containers:

- Unexpected.
- With an organic shape (curved shape).
- With a symmetrical shape (having sides or halves that are the same).
- With bright colours lively or neutral.
- Related to the product carried in it.
- Reusable and bendable.
- Clients care about attractive shapes but also value the easy manipulation and comfortable storage of the container.

These results are useful to reinforce the product’s bond with the consumer once at the supermarket. Noticeably, the likes towards a container are subjective, however with the results obtained from both surveys and the information gathered from books and articles it is possible to achieve a design which would attract as many clients as possible.
4 Clarifying objectives

4.1 Classification of Requirements

At it is previously stated in this report, The Performance Specification Method (Cross, 2000) was chosen as tool to organize the requirement list. So, after having collected all the information from CC pack, possible clients’ surveys and literature study, it is a perfect point to start creating a good specification chart Table 4.1.

The specification chart consists of five different columns. Every of these columns are described below.

- The first column groups the specifications in three main fields; functionality, usability and aspects that help to make a more pleasurable product.
- The second column contains all the attributes taken from the research. They are the conditions that a design proposal should satisfy.
- The third column shows performance specifications for each attribute. The specifications have been written following the guideline from The Performance Specification Method.
- The fourth column classifies each specification on demands (compulsory to accomplish) or wishes (accomplish if it is possible).
- The last column links each specification with the Jordan’s pleasure it is related to. More than one pleasure can be linked to the same specification.
### Table 4.1: Specifications chart.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Specification</th>
<th>Wish or Demands</th>
<th>Pleasures it is related to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminium tray</td>
<td>Must be made of aluminium</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td>Bear high temperatures</td>
<td>Withstand 250°C as minimum</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td>Producible by CC Pack’s machines</td>
<td>Draft angle for tooling &gt; 10 degrees</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>55 mm deep as maximum</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>At least 40 µm in thickness</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td>Adapt to every supermarket</td>
<td>Two supporting surfaces to show the product both vertically and horizontally</td>
<td>W</td>
<td>Physio-Pleasure</td>
</tr>
<tr>
<td>Usability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough space for information</td>
<td>Including the compulsory information according to the legislation</td>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td>Easy opening system (manually)</td>
<td>Use an already known manual opening system</td>
<td>D</td>
<td>Physio-Pleasure</td>
</tr>
<tr>
<td>Properly and safety use</td>
<td>Ensure a good use through a brief manual</td>
<td>D</td>
<td>Ideo and Physio-Pleasure</td>
</tr>
<tr>
<td>Easy stacking for transport</td>
<td>Less than 10% of free space after organize the product on an European pallet</td>
<td>D</td>
<td>Physio-Pleasure</td>
</tr>
<tr>
<td>Not expected product</td>
<td>Create something that competitors do not have</td>
<td>D</td>
<td>Psycho-Pleasure</td>
</tr>
<tr>
<td>Possibility to close again</td>
<td>Create a system to close the product after open it</td>
<td>W</td>
<td>Psycho and Physio-Pleasure</td>
</tr>
<tr>
<td>Include cutlery</td>
<td>Add cutlery without modifying the product</td>
<td>W</td>
<td>Socio and Physio-Pleasure</td>
</tr>
<tr>
<td>Reduce the slippage risk</td>
<td>Add grain texture on the bottom surface</td>
<td>W</td>
<td>Physio-Pleasure</td>
</tr>
<tr>
<td>Non-bulky residue</td>
<td>Possibility to reduce the packaging’s size after finishing the meal</td>
<td>W</td>
<td>Ideo and Physio-Pleasure</td>
</tr>
<tr>
<td>Starter and main meal in the same tray</td>
<td>Create a packaging with two compartments</td>
<td>W</td>
<td>Ideo and Physio-Pleasure</td>
</tr>
<tr>
<td>Eco-friendly product</td>
<td>Recyclability &gt; 80%</td>
<td>W</td>
<td>Ideo and Socio-Pleasure</td>
</tr>
<tr>
<td>Interaction between packaging and consumer</td>
<td>Show the real food inside the packaging</td>
<td>D</td>
<td>Psycho-Pleasure</td>
</tr>
<tr>
<td>Shape according to future clients preferences</td>
<td>Organic shape</td>
<td>W</td>
<td>Ideo and Psycho-Pleasure</td>
</tr>
<tr>
<td></td>
<td>Symmetric shape</td>
<td>W</td>
<td>Ideo and Psycho-Pleasure</td>
</tr>
<tr>
<td></td>
<td>Shape related to the product that the packaging contains</td>
<td>W</td>
<td>Ideo and Psycho-Pleasure</td>
</tr>
<tr>
<td>Extra skills to add value</td>
<td>Ornate typeface</td>
<td>W</td>
<td>Psycho-Pleasure</td>
</tr>
<tr>
<td></td>
<td>Congruency between shape-colour</td>
<td>W</td>
<td>Ideo and Psycho-Pleasure</td>
</tr>
<tr>
<td></td>
<td>Painted aluminium</td>
<td>W</td>
<td>Psycho-Pleasure</td>
</tr>
</tbody>
</table>
From here, the solution that fulfils the larger number of wished requisites could be the most appropriate for that project. But not every requirement have the same importance, for that reason, product requirements have been evaluated according to “Criteria weighting for wishes” (Johannesson, Persson & Pettersson, 2009). This criterion compares the requirements to each other and organises them by the level of importance, this is showed in Figure 4.1.

As a result of applying this method, the requirements have been sorted by their weight. The total amount of weight is 100. Specifications are shown in the following graphic from higher to lower importance.

![Figure 4.1: Requirement's weight according to “Criteria weighting for wishes” (Johannesson, Persson & Pettersson, 2009).](image-url)
5 Concept generation

After creating the requirement list it is time to start preparing the outline design proposals. Different alternatives, shown through sketches, will be evaluated and judged according to different methods, in order to reach the final decision. Those tasks correspond with the synthesis step of the Archer’s model. The followed methodology is not a pre-defined one. The design team has by mixing several methodologies created this new one. The reason of creating a new methodology is because the design team wanted to be free at the time of add generation or evaluation process to achieve a good solution. Otherwise if an existing methodology is used, the design team will be free to go back and correct, but it is not free to include different step to follow. The final aspect of that methodology is shown in Figure 5.1.
**Figure 5.1:** Design Methodology Scheme.
New-product development starts with "Idea Generation". To achieve a final design, normally hundreds of ideas must be generated, though most of them end up rejected. The quality of the final design depends on the quality of the ideas generated (Cross, 2000). There are many methods, of both generation and evaluation of available ideas with which to achieve a good final result. Nevertheless, knowing how to mix these methods is complicated.

5.1 Brainstorming

Once the information obtained previously is organised, brainstorming will be the method that will lead the project to reach the first results. Brainstorming is a creative method of ideas generation. Creativity often appears when you less expect it, however the brilliant ideas do not occur without a previously background work of a problem (Cross, 2000).

At the beginning of the idea generation, the project begins from square one. In this situation, the most appropriate is starting using a method of creative generation. The aim of choosing brainstorming is because it does not impose any kind of restriction. No matter the idea, whether it is valuable or not, in this case any purpose will be approved. So working with creative methods involve a removal of mental blocks, allowing to obtain a greater flow of ideas (Cross, 2000).

Brainstorming is normally done by a small group of 4-8 people, and the practice does not take more than 30 minutes. To obtain the highest performance of this method, the atmosphere between team members is very important, humour and good connexion will permit a greater flow of ideas (Cross, 2000).

The group must not be hierarchical but it should be able to avoid round table discussion. To begin with the method a question is usually generated. In this case the question was: "How can an aluminium packaging satisfy the highest number of customers' requirements as possible? After having formulated the question, small record cards are used to write the ideas. Each idea is written in a different card and then discussed with the design team. Now is when the other members of the design team complement the ideas and later the sketches are generated (Cross, 2000).

All the sketches generated during the process of brainstorming are shown on Appendix 3. There are fourteen sketches generated on the first session. Some of them are shown in Figure 5.2, Figure 5.3, Figure 5.4 and Figure 5.5.

The results obtained were very diverse, from geometrical shapes to more organic shapes.
Once the brainstorming session was over, it is necessary to analyse each resulting concept. Taking into account that they are early ideas, created with no kind of restriction, the design team, regarding the mandatory requirements of the product, will carry out an assessment. When this evaluation will finish, only
the concepts, which fulfil all the demands will follow as valid proposals in the design process. Discarding reasons are included in the following Table 5.1. Once this evaluation was performed, the initial number of ideas (14) has been reduced, remaining only 8 suitable proposals.

**Table 5.1: Chart of the selection of existing sketches.**

<table>
<thead>
<tr>
<th>Number of sketch</th>
<th>Continue?</th>
<th>Discarding reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
<td>It is an already existing packaging.</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>No</td>
<td>It does not bear the minimum temperature.</td>
</tr>
<tr>
<td>5</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>No</td>
<td>It is not possible to manufacture by CC Pack machines.</td>
</tr>
<tr>
<td>7</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>No</td>
<td>It does not bear the minimum temperature.</td>
</tr>
<tr>
<td>11</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>No</td>
<td>It does not show the food inside the packaging.</td>
</tr>
<tr>
<td>13</td>
<td>No</td>
<td>It does not have enough space for information.</td>
</tr>
<tr>
<td>14</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Continuing with these 8 ideas until choosing only one of them would be the easiest way, but not the most suitable. Therefore, the design team has decided to apply another generation method, a rational one. It is suitable to combine a creative method with a rational one, since this last method can obtain solutions that are different from the ones that can be reached with a creative generation.

**5.2 Morphological Chart Method**

After this initial evaluation, the generation of ideas about these eight proposals stays in operation.

For this second generation of ideas the "Morphological Chart" will be used. This method of generation of ideas, unlike Brainstorming, belongs to a more rational method (Cross, 2000).

Morphological Chart aims to generate alternatives based on previous ideas. This method is intended to complement the resulting sketches of the Brainstorming and introduce aspects that are incorporated into the design in order to create new concepts / sketches (Cross, 2000). “Creativity can often be seen as the re-ordering or re-combination of existing elements.” (Cross, 2000, page 123). The resulting Morphological Chart is shown below:
Table 5.2: Morphological chart.

<table>
<thead>
<tr>
<th>SOLUTIONS</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLOSING SYSTEM</td>
<td>Cardboard lid</td>
<td>Film Lid</td>
<td>Cardboard and film lid</td>
</tr>
<tr>
<td>GENERAL FORM</td>
<td>Geometric Form</td>
<td>Representing the food that it contains</td>
<td>Tray inside a cardboard box</td>
</tr>
<tr>
<td>MATERIALS</td>
<td>Aluminium + Cardboard</td>
<td>Aluminium + Film</td>
<td>Aluminium + Cardboard + Film</td>
</tr>
</tbody>
</table>

Twenty-seven combinations of solutions have been obtained. But only 9 of those 27 could be carried out because the rest of combinations are incoherent. With these combinations, the alternatives shown in Appendix 4 have been generated. Six more sketches were obtained from this design method. Some of these sketches are shown below in Figure 5.6 and Figure 5.7:

**Figure 5.6**: Sketch number 16, generated from Morphological Chart.

**Figure 5.7**: Sketch number 19, generated from Morphological Chart.

And now, the ideas that have been generated from the morphological chart will be subject to a new assessment phase to determine whether they are acceptable proposals or not.
5.3 Matrix of weight based on demands

Only mandatory requirements have been taken into account during this second product’s evaluation. But it would be interesting to specify, apart from which proposals are acceptable or not, the place each one will take on a ranking of higher or lower validity. That is why a matrix of relative weight should be used, since it allows applying several levels of importance to each requirement. Each alternative has been assessed concerning those requirements. Three different symbols will be used in order to indicate the precision with which each alternative meets each requirement. These three symbols represent different levels of precision (triangle = 3, circle = 2, square = 1), being 3 the highest level and 1 the lowest.

*Table 5.3: Matrix of weight based demands.*

<table>
<thead>
<tr>
<th>DEMANDS</th>
<th>ALTERNATIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure a good use through a brief manual</td>
<td>6</td>
</tr>
<tr>
<td>Bear 250°C as minimum</td>
<td>10</td>
</tr>
<tr>
<td>Aluminium foil</td>
<td>14</td>
</tr>
<tr>
<td>Ensure an optimal storage on pallet</td>
<td>9</td>
</tr>
<tr>
<td>Draft angle for tolling &gt; 10 degrees</td>
<td>14</td>
</tr>
<tr>
<td>Different from competitors</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 40μm in thickness</td>
<td>14</td>
</tr>
<tr>
<td>Show the food inside the packaging</td>
<td>9</td>
</tr>
<tr>
<td>&lt; 55 mm depth</td>
<td>14</td>
</tr>
<tr>
<td>Enough space for information</td>
<td>11</td>
</tr>
<tr>
<td>Already known manual opening system</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL WEIGHT</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALTERNATIVE’S WEIGHT</td>
<td>239</td>
</tr>
<tr>
<td>RANK ORDER</td>
<td>11</td>
</tr>
</tbody>
</table>

Once the matrix is applied, the project counts with different acceptable alternatives, which are ordered from the best to the worst. So as to continue with the search of a last solution, only the 5 best alternatives have been selected (alternative number 3, 7, 8, 15 and 16).
5.4 The Weighted Objectives Method

Whereas these 5 proposals were analysed, it was noticed that each of them had their strengths and weaknesses. So, it was decided to combine their strengths with the different alternatives, in order to create more powerful alternatives. To carry it out, it is recommended using an already defined method. In this case, the weight objective method was chosen (Cross, 2000) since it is a method that assesses each alternative regarding to wishes. It was also chosen due to it can be used during different steps, the first one will show which alternative is stronger, as well as which other alternatives must be combined.

*Table 5.4: Matrix of weighted objectives method.*

<table>
<thead>
<tr>
<th>SELECTION CRITERIA</th>
<th>CONCEPTS  (Reference)</th>
<th>3</th>
<th>7</th>
<th>8</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add grain texture on the bottom surface</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Possibility to close again</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Possibility to reduce the packaging’s size after finishing the meal</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Include cutlery</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Create a packaging with two compartments</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Recyclability &gt; 80%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Organic shape</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Symmetric shape</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Shape related with the product that the packaging contains</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Ornate typeface</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adapt to different supermarket’s shelves (Show the product both vertically and horizontally)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Congruency between shape-colour</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Painted aluminium</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Combinations, created after this first step, are shown in Appendix 5. They are the sketches A, B and C. During the second step, once all possible combinations have been generated, and taking into account the alternative number 16, a final evaluation is carried out; this will show which concept must be developed as last solution.

![Figure 5.8: Sketch B, generated from Weighted Objectives Methods.](image-url)
Table 5.5: Matrix of weighted objectives method.

<table>
<thead>
<tr>
<th>CONCEPTS</th>
<th>Relative Weight</th>
<th>Combination A</th>
<th>Combination B (Reference)</th>
<th>Combination C</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add grain texture on the bottom surface</td>
<td>5.2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Possibility to close again</td>
<td>10.2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Possibility to reduce the packaging’s size after finishing the meal</td>
<td>9.3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Include cutlery</td>
<td>6.1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Create a packaging with two compartments.</td>
<td>10.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Recyclability &gt; 80%</td>
<td>9.7</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Organic shape</td>
<td>5.8</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Symmetric shape</td>
<td>4.6</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Shape related with the product that the packaging contains</td>
<td>7.8</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Ornate typeface</td>
<td>4.7</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Adapt to different supermarket’s shelves (Show the product both vertically and horizontally)</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Congruency between shape-colour</td>
<td>8.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Painted aluminium</td>
<td>6.6</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total Score</td>
<td>327</td>
<td>300</td>
<td>217</td>
<td>310</td>
<td></td>
</tr>
<tr>
<td>Rank</td>
<td>1*</td>
<td>4*</td>
<td>2*</td>
<td>3*</td>
<td></td>
</tr>
<tr>
<td>CONTINUE?</td>
<td>DEVELOP</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

Once assessment and idea generation methods have finished, and having combination A as the alternative to develop it is time to work on that. Last improvements should be incorporated at this moment in order to obtain the best result possible. Remember that the best result would be that one which fulfils as many customers’ wishes as possible. Figure 5.9 illustrates combination A.
5.5 Visualisation of combination A

Making reference to Archer’s model again, the following part of the project will close the creative phase. Development section consists on continuing with the final design alternative. In this case, after having realised 3 different evaluations, the combination A, started to be developed with two software systems for 3D
modelling, called AUTOCAD and PTCCREO PARAMETRIC. With these tools, aluminium tray, Figure 5.10 and cardboard box, Figure 5.11, were created.

*Figure 5.10: Aluminium tray - Primary packaging.*

*Figure 5.11: Cardboard box - Secondary packaging.*

Once the complete packaging modulation was obtained, the next step was firstly getting the drawings and then their limiting, as it can be seen in Appendix 6.

For this step, both the measures and the final form were defined regarding the measures that CC Pack provided as valid for the packaging manufacturing. The most important restriction was that it was not allowed to exceed 55 mm of height.
At the same time the colour composition was started as well as the graphic design form. This composition was made using the data from level 3, pleasure, obtained during the information gathering. From the beginning the design was sought from a minimalist line, inspired by nature. Natural elements were chosen, such as waves and fish.

As it can be seen in Figure 5.9, one part of the aluminium tray remains in the box, in order to ensure its encrusting. So the fish shape would be cut. This is why, and not according to an aesthetic issue, the head of the fish was included, in order to keep the organic shape of the aluminium tray.

The main colour for the cardboard box was its original. With this election, natural aspect was intended as well as preserving environment, as a great amount of paint and chemicals was removed.

Taking into account the organic shape of the aluminium packaging, shown in Figure 5.10, and the data from Figure 3.7, that relates the coherence between shape and colour, the next election of graphic design was carried out.

- Low saturation golden aluminium foil was used to create the aluminium tray. Achieving a good level of overall product attitude. Changing the common aluminium’s aspect, the product’s striking appearance raises because it is something weird among existing products. Something positive in this case due to the desire of obtaining something different from competitors.

- As it can be seen in the sketch from Figure 5.9, aluminium tray is combined with a cardboard box. Creating then, a good contrast both of form and material. To obtain good results according to form-colour congruency, high-saturated colours were chosen, due to the angular shape of the cardboard box.

Several simulations were created with graphic design software as Photoshop and Adobe Illustrator. The final choice is shown in Figure 5.12 and Figure 5.13.
**Figure 5.12:** Front view of packaging.

**Figure 5.13:** Bottom view of packaging.
6 Results

Following Archer's model, it is time to run the "Executive phase". This is the last phase. To do this, all the product's aspects achieved are described below, regarding its requirements. The previously evaluation methods used have achieved a final solution which meets all mandatory needs. Communicating this final solution, Archer's model is finished, which means that a solution has been obtained.

Apart from the demanded requirements, there are many others that can be checked at the first view; like the organic shape, symmetry, two different compartments or a shape related to the product. Below the rest of requirements are shown as well as how the final product fulfils them is justified.

- Ensure a good use through a brief manual.
  As mentioned above, the aim of the instructions is not only to show how the packaging must be opened. That is intuitive because the resulting design is not complex. Since the packaging can be heated in an oven or microwave, these instructions will also warn about certain aspects about this.

For example not everyone knows that more than one aluminium packaging cannot be introduced in the microwave at the same time. Also, some basic tips to protect consumers are given. It warns that it is convenient to use a washcloth to remove the packaging from the microwave since the high temperature of the hot food is transmitted to the material.

And finally, another important point included in the instructions is the placement of the removable lid. This last step is indicated in the instructions because it is a complement of design that is not included in other existing packages in the market. The shape of the removable lid is the same as the packaging, and also to make it more visible, it only matches the rest of the box ends, and it will be perforated as well. Despite the fact this is quite intuitive, it has been included briefly in the instructions.

The tasks included on the cardboard box are shown in Figure 6.1.
Figure 6.1: Use indications.

- Show the real food inside the packaging.

An example of how the final solution is in Figure 6.2, here it can be seen how the food inside the tray is shown. This is achieved through the combination of:

Sealing of the plastic film lid with the aluminium tray, which ensures that the food does not come out of the primary packaging. And the window in the cardboard box, which lets you see the primary packaging.

Figure 6.2: Product's final appearance.
- Use an already known manual opening system.
The final packaging can be opened without using any kind of tool, just with the hands. The only thing to do in order to open the product is removing the plastic film lid, which is the same as in most of packaging that consist on an aluminium tray.

The back cover, which is located in the secondary packaging, is perforated in case its use is necessary. It can be removed easily with hands without using any kind of tool since it is perforated.

- Add grain texture on the bottom surface.
Rough texture has been added on the bottom packaging’s surface in order to avoid possible sliding.

- Painted aluminium.
Low saturated gold has been chosen for the aluminium tray, in order to differentiate from the competition, which uses to have most of their packaging in aluminium’s common colour.

![Figure 6.3: Painted aluminium tray.](image)

- Enough space for information needed according to the legislation.
All the information needed could be written inside of the cardboard box. Moreover, there is free space to include some extra information, like its benefits, if a future client needs it.

- Easy stacking for transport.
It is important to take into account the stacking for transport and storage of product. It is appropriate to design thinking about saving space since a saving in space leads to a saving in money. Any change in the structure of the product affects product’s supply chain, and this at the same time affects the quality and price of the product. As the quality and price are the most important influential factor in the markets’ demands (Rezapour, Hassani & Farahani, 2015).

The secondary packaging has a geometrical shape, so there is no free space between products when they are organised on pallets. Otherwise, the percentage of unused space of the final pallet is less than 10%, as it can be seen in Figure 6.4.
Figure 6.4: Calculation of free space.

- Two supporting surfaces to show the product both vertically and horizontally.

Packaging has been thought to achieve this important requirement. Achieved the requirement known as "Show the food, which is inside the packaging" it is then necessary to take a step further. That is to say, the shape of the secondary packaging has to be taken into account so that when this is placed on the shelves or refrigerators of the supermarkets, the vision of the food is not reduced.

If the shape of the packaging does not have a good angle of vision to the client, it is pointless for the product to have transparent film. That is why the shape of the packaging is so important.

In this case the shape of the final design is favourable. The secondary packaging has a rectangular shape, therefore it allows a good placement on shelves, where the placement of the product is usually vertical, as well as in refrigerators, where depending on the type of refrigerator, the product can be found horizontally or vertically.

Regardless of the case, as it can be shown in Figure 6.5, the packaging can be orientated in both directions, showing the primary container without any problem.
Create a system to close the product once it has been opened. It is also possible because the product contains a removable cardboard lid on the bottom surface of the cardboard box and the tray count with a slot to introduce that lid. It can be seen in Figure 6.6

In order to create this slot, it is necessary to implement the model of the press, with a blade working as a slider on its side. This way, once the piston reaches its last position resting on the top surface, the blade will slide out creating the slot we were looking for.

Obviously, the cardboard lid does not provide an air-tight seal system, but it helps to keep food in better conditions that leaving the tray wide open. In order to fix this lid, the sides of the tray must be bent, providing pressure on it.

Add cutlery without modifying the package. The product gives the chance to include the cutlery inside of the cardboard box. Figure 6.7 has been created to show the cardboard development and how cutlery could be included on it.
Possibility to reduce the packaging’s size after finishing the meal. This specification is fulfilled due to the aluminium foil thickness. As it is stated at level one of the literature survey, this foil thickness is 200µ, which means a semi-flexible aluminium tray. Easy to blend and reduce its size.

Congruency between shape and colour. As it is explained before, the whole packaging has been designed to achieve the required congruency, as well as a good contrast between the tray and the cardboard box.

Recyclability > 80%. The respect for the environment of the product is quite high. It is due to its material, aluminium that is 100% recyclable and cardboard, which could be elaborated from recycled materials. So the eco-friendly aspect of the product can be proven by including stamps that certify it. The example from Figure 6.6 has two of those stamps, as example of how it will look like.

Ornate typeface
The collected data obtained in previous researches affirms that people use to pay more attention to packaging with ornate typeface. So in this case, the selected type has been “Nanum Pen Script Regular”, which is shown below in Figure 6.8.
Below, renders, that represent the real aspect of the whole packaging, are shown in figures from Figure 6.9 to Figure 6.11. Otherwise, manufacturing requirements can be checked in Appendix 5.

**Figure 6.9:** Example of packaging in a real environment.

**Figure 6.10:** Example of packaging in a real environment.

**Figure 6.11:** Example of packaging in a real environment.
## Conclusions

In this section, the suitability of the last result will be analysed. The method chosen is contrasting the product, with all the wishes included on the chart. Only the wished will be compared, as a matter of fact that it is the last solution, regarding the previously applied assessment methods, it supposes each mandatory is fulfilled. The bigger the number of wishes accomplished, the better the last solution will be considered.

The chart shown below indicates the wishes that are fulfilled by the product, and those that are not.

<table>
<thead>
<tr>
<th>FULFILLED</th>
<th>NON FULFILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show the product both vertically and horizontally</td>
<td>Add surface’s texture to reduce the slippage risk.</td>
</tr>
<tr>
<td>Ornate typeface</td>
<td></td>
</tr>
<tr>
<td>Starter and main meal in the same tray</td>
<td></td>
</tr>
<tr>
<td>Possibility to close it again</td>
<td></td>
</tr>
<tr>
<td>Recyclability&gt; 80%</td>
<td></td>
</tr>
<tr>
<td>Non-bulky residue</td>
<td></td>
</tr>
<tr>
<td>Congruency between shape-colour</td>
<td></td>
</tr>
<tr>
<td>Shape related with the product</td>
<td></td>
</tr>
<tr>
<td>Painted aluminium</td>
<td></td>
</tr>
<tr>
<td>Organic shape</td>
<td></td>
</tr>
<tr>
<td>Symmetric shape</td>
<td></td>
</tr>
<tr>
<td>Include cutlery</td>
<td></td>
</tr>
</tbody>
</table>
At the end, the product has fulfilled 12 from 13 wished requirements. It is a very good number, which means that the final solution can be considered as a really good solution, otherwise, the product will be shown to future clients in order to know their opinion.

As it is said before, the striking appearance is too difficult to assess. It depends on each consumer perception, so conclusions regarding this requirement cannot be taken. But to get an idea of the reaction of potential future clients towards the packaging, a third survey was created.

Just as in the first survey, 40 people were selected randomly. This survey can be found in the Appendix 7 and it shows the final packaging along with five more packaging that already existed in the market. All of them have a characteristic in common; they are aluminium trays. The aim of proposed package design is to know the acceptance of this design in the market; to know which packaging the clients preferred to buy when they are shopping. The questions asked in the survey are personal and subjective. Since terms like “attractive” could not be used previously in the project because of its subjectivity, the goal of this survey is to know how “attractive” the final design would be in respect to other packaging for consumers. The results of the survey are favourable and they can be seen in Appendix 7.

The packaging design of this project gets the best results in the first 4 questions. Thus, the main conclusion after analysing the results is that the packaging would have a good acceptance in the market. Therefore the general conclusions are positive. The final product has met almost every aspect it was asked for. According to Jordan’s adaptation of the Maslow’s Hierarchy, fulfilling the product requirements the product is closer to be functional, usable and pleasurable. With these characteristics it is probable that companies such as those shown in the Figure 1.2, all which are clients of CC Pack, will be interested on buying that product.

7.1 Improvement of cardboard package design

However, the result is considered quite acceptable, there is an aspect that should be improved though. It is the space not used during the transport. When the final design was done it was realised that the resulting design does not really fulfil the demand “Easy stacking for transport” with the specification “Less than 10% of free space after organize the product on an European pallet”. Because the space remaining between the carton structure and the aluminium tray may have not been taken into account. Therefore, the provided data in chapter 6 “Results” were not right at all. Since the spare space on the pallet should be added to the space not used inside the product itself.

It is true that this problem does not affect the entire transport’s process, since the product varies its form in the course of each trajectory. As known, the final product consists of an aluminium tray and an external cardboard structure.
However, its final form is not settled until the last part of the transport, meaning, from the moment it leaves the packing plant till it arrives at the selling point.

The routes needed previous to the packing plant, are performed separately. On the one hand, the aluminium trays are stacked one on top of the other, as to save space, while on the other hand, the cardboard structures are transferred without being attached, that is as flat printed cardboards. Consequently also taking advantage of the space.

Evidently, problems could come when the product is settled to its final form and delivered to the sales sites. Therefore, seeking to fit it at its best, the cardboard structure should be minimized, yet still respecting the cherished shape.

A graphical description of how a minimized final product could be distributed in a European pallet is shown below in Figure 7.1.

![Figure 7.1: New calculation of free space.](image)

The waste space could be optimize even more by modifying the original cardboard structure completely. However, due to the main creative idea of producing a more pleasurable and aesthetic packaging for the final consumers, these extra modifications have been discarded and thought as not actually required.
As it can be seen in Figure 7.2, packaging keep having the same skills as before, but becoming slightly smaller.

Figure 7.2: Difference between old and new packaging size.
8 Future contributions

In this project, a new aesthetic line for aluminium packaging has been created. In this case, only packaging for fish has been developed, creating 3D models as well as renders representing the real product.

Otherwise creating packaging for different kind of food, following the aesthetic created by the design team, can complement this project. In order to show how it could look, renders for two different examples, one for meat and other for vegetables, have been created. They can be seen in figures in Figure 9.1 and Figure 9.3. And their trays are also shown in Figure 9.2 and Figure 9.4.

![Chicken Curry & Chips](image)

*Figure 9.1: Graphic design for a meat meal.*

![Chicken Tray](image)

*Figure 9.2: Chicken tray.*
Figure 9.3: Graphic design for a vegetable meal.

Figure 9.4: Vegetable tray.

Future application could be the packaging's creation for others kind of food as can be pasta, desserts, soups and so on. In this way, if a future client is interested of those packaging, it will be able to commercialize its entire products with the same aesthetic line. This fact will suppose that when people see that packaging, with any kind of food inside, they will recognise the products’ producer.

Other line of investigation could be implemented after creating the real product. Once the prototype is ready several tests, as mechanic’s features evaluations, could be applied in order to modify and improve the packaging.
9 Discussions

At this point, it is time to generate a critical overview about the project.

It is true that the design team was quite lost at the beginning, as the problem was not completely clear and well defined. But little by little and with the collaboration of third people, like the project’s supervisors and the employees from CC Pack, the company for which the project has been carried out, everything started to go in the right direction. Once the main problem was well defined, the methodology to follow as a structure for the design process was selected.

The next step for the development of this project was to make a very important choice. The project will be conducted regarding to the model chosen, which should be used to find the desired solution. The use of Archer’s model of the design process has been considered as a good choice. Follow this model from the beginning has helped a lot to the design team. Design team has never been lost because Archer’s model is well divided in its steps and it is easy to follow. The structure of this report is based on Archer’s model as well, thanks to that it is coherent and readers are going to understand everything, step by step, when they read it.

The research and gathering of all the information required to know the needs that this project’s solution should fulfill was a step difficult to take. At the beginning the search was focused in gathering information to reach an attractive packaging. Something that is impossible for us to know for sure, as the term attractive is very subjective and everyone has a different perception of its definition. At this point the research changed its direction completely, considering it a turning point, we began to search for and create a pleasurable product for the highest number of people possible. To start with, gathering information about Maslow’s hierarchy was made. But this hierarchy provided information that was too general. That is why, the research continued. Finally there were the 4 pleasures of Jordan the ones that made the definition of goals possible. Besides, taking into account that Jordan follows the same aim as this project, it was the best alternative.

After that and having read among many books, magazines, scientific articles, webpages and the information provided by CC Pack, as well as carrying out two surveys to those considered as possible future clients, the product’s requirements were established following “The Performance Specification Method”.

Perhaps to get a better customer study it would have been interesting to add an “observation” section. Observing how customers of different ages and gender act when interacting with similar products would have helped to discover potential weaknesses of these.
Once the requirements were established, it was the moment to generate and evaluate alternatives until the most suitable option for our projects needs was chosen. This is considered the most important part by the design team and it is thought that the methods chosen, to generate and evaluate the different alternatives, were successful and correct, as it turned out to be that these methods guided us towards a favourable result.

Regarding the first generation of ideas there are some objections. The method followed in this generation was the Brainstorming. This method is generally carried out with a group of 4-8 people. But still it was chosen because it is considered a very good method to get a lot of initial ideas. Although perhaps it would have been interesting to ask fellow design students, or even students from other degrees such as Marketing or Business Administration to join at this stage to bring more ideas.

Moreover it would be very interesting if a similar project was carried out in the future, using different methods in order to compare the solutions of one project and the others. Especially, as it was suggested, after having introduced the project, the usage of methods based on personas and scenarios could have been a more suitable decision. But it was too late to change it, although it would be an interesting proposal to be studied in the future by other students.

Regarding the model creation using CAD tools, we considered it was not laborious at all as it was a relatively simple product. Nevertheless, it was very useful by the time of assessing the product, as the renders applied during the poll survey to know future clients. As it can be seen in Appendix 7, the results have been favourable in most cases, which mean that clients have accepted the product. It is true that the product is shown just in a picture; however, it is good to know that people consider the product as an attractive, innovative and natural packaging.

An interesting way to improve this part in future contributions would be the creation of physical prototypes. Creating a mock-up would provide the project with a more realistic and reliable vision of the consumer's opinion, and allows the realization of "usability and pleasurable tests".

As indicated in the conclusions section, the storage system for transport could have been more optimal. This is the reason why more optimal measures are given. But given that the failure only happens in such a short percentage of the trajectory, and that the packing structure is one of the strong points of the product, changing the shape of it, was not considered.

While it is true that, the dimensions of the structure should be reduced in order to diminish the free space problem. Even so, these changes would be purely functional. Therefore, neither the aesthetic nor the technical aspects of the product would change.

This mistake is due to the description of the problem. From the beginning, CC Pack addressed us to mainly focus on the aesthetic aspect of the product. The
company did not impose any kind of restriction when designing, what is more, their exact words were: ‘go banana’. Even so, we decided to open a section to optimise the shipping system, because it is something to take into account with any product.

From the very first moment, we only based on optimising the distribution of the space in a tertiary container, in this case a European pallet. This allowed not to take into account the free space from the product itself. For these reasons, easy stacking for transport point is considered not to be 100% achieved. Nonetheless, a valid solution is considered, despite the fact that it is not, indeed, the most optimal achievable result.

By this same reason we have not taken into account the financial issues related to the product, as CC Pack provided absolute freedom in this aspect. However, the material applied is in type as well as quantity, very similar to the packaging from the competitors. So, we can deduce that the last price will be competitive to the rest.

In general terms, we are proud about the work carried out throughout this project, as the achieved solution has satisfactorily fulfilled our expectations.
References


APPENDIX 1. Interview

INTRODUCTION

- The purpose of this survey is to try to collect information about customers’ personal opinion regarding packaging and recycling of used packages.

- Celia García Cobo and José Miguel Campillo Navarro conduct this survey. (Students of Högskolan i Skövde / The University of Skövde).

- All participation in this survey is completely voluntary.

- All collected information will be confidential.

- Completing the survey takes approximately two minutes.
MAIN QUESTIONS

1. How much time do you spend choosing a product in front of the supermarket shelf?
   a. Less than 3 seconds.
   b. More than 3 seconds.
   c. More than 5 seconds.
   d. More than 10 seconds.

2. How does the packaging influence your choice?
   a. Very little. I don’t usually pay attention to the packaging, I always know what product I want.
   b. Somewhat; first I take the most attractive packaging and then I read the information about the product and compare it with other products.
   c. A lot, I always choose the most attractive packaging because I trust the signals the packaging sends me.

3. Do you usually find out a product’s quality through the packaging?
   a. Yes.
   b. No.

4. What kind of packaging aspect catches your attention most of all?
   a. Size.
   b. Material.
   c. Graphic Design.
   d. Form.

5. What kind of packaging would you choose? One that:
   a. Shows the product through an image.
   b. Mainly shows the brand of the product.
   c. Shows detailed information about the product.
   d. Shows the real product inside the box, which is made of transparent materials.
6. When you are deciding between two products. How do you choose?
   a. Comparing the price.
   b. It depends on the brand.
   c. Visual appearance.

7. Do you usually check if the packaging is Eco-friendly?
   a. Always, it is important for me.
   b. Never, I do not care about it.
   c. Sometimes, but it is not my priority.

8. Complete the following chart according to how you consider the importance, at the purchase time, of:

<table>
<thead>
<tr>
<th></th>
<th>Very Important</th>
<th>Important</th>
<th>Less important</th>
<th>Not important</th>
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<tr>
<td>Price</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Size</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Phyisc Design</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Quality</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Functionality</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

PERSONAL QUESTIONS

Please, select your gender.
A. Female
B. Male

Please, select your age.
A. Less than 18
B. 18-24
C. 25-34
D. 35-44
E. 45 and over
F. I prefer not to say
RESULTS

Question 1

Question 2

Question 3

Question 4
Question 5

- A: 10%
- B: 7%
- C: 10%
- D: 73%

Question 6

- A: 42%
- B: 33%
- C: 25%

Question 7

- A: 65%
- B: 10%
- C: 25%

Question 8

- Quality
- Functionality
- Price
- Graphic d.
- Physical d.
- Size
INTRODUCTION

- The purpose of this survey is to obtain a wider range of knowledge from what really affects a client’s subjective likes and preferences towards a packaging.

- Situation: The client is going to buy pre-cooked food in an aluminium package and ready to be heated in the oven or in a microwave.

- Requirements: Be truly sincere and realistic when answering each question.

- All participation in this survey is completely voluntary.

- All collected information will be confidential.

- Completing the survey takes approximately two minutes.

- Celia García Cobo and José Miguel Campillo Navarro conduct this survey. (Students of Högskolan i Skövde / The University of Skövde).
MAIN QUESTIONS

1. How important is the shape of the package for you?
   a. The shape is quite important: I feel satisfied if it is eye-catching. I don’t really care what advantages in handling or storage the container may have.
   b. Although I do need it to catch my attention, I also value that it offers an easy storage and handling usage.
   c. I don’t care about the shape I’m practical. I only care about the container’s easy use and storage.

2. Which shape would you like the container to have?
   a. I prefer Geometrical shapes, meaning one with mainly straight angles.
   b. I prefer an organic shape.

3. Regarding the global container:
   a. I prefer to find conventional containers.
   b. I prefer to find unexpected and outgoing ones.

4. Regarding the <container-product> relationship:
   a. I prefer if the container has no relation with the product.
   b. I prefer if the container has some relation with the product.

5. Regarding the colours of the container:
   a. I prefer bright and lively colours.
   b. I prefer neutral colours.
   c. I prefer dark and less intense colours.

6. Regarding the containers stiffness:
   a. I prefer a completely stiff container.
   b. I prefer a container that can be bent to reduce its size after it has been used.
7. Regarding the containers symmetry:
   a. I prefer symmetrical containers.
   b. I prefer asymmetrical containers.

8. Regarding the inner structure of the container:
   a. I prefer a container with several compartments for the edibles.
   b. I prefer a container with one only compartment.

9. Regarding the content in the container:
   a. I prefer if it only carries the food.
   b. I would prefer for it to also carry accessories such as cutlery and/or napkins.

**PERSONAL QUESTIONS**

Please, select your gender.
A. Female
B. Male

Please, select your age.
A. Less than 18
B. 18-24
C. 25-34
D. 35-44
F. 45 and over
G. I prefer not to say
RESULTS

Question 1
- A: 5%
- B: 20%
- C: 75%

Question 2
- A: 33%
- B: 67%

Question 3
- A: 37%
- B: 63%

Question 4
- A: 27%
- B: 73%

Question 5
- A: 43%
- B: 40%
- C: 17%

Question 6
- A: 23%
- B: 77%
APPENDIX 3. Sketches generated from Brainstorming.

Sketch number 1:

Sketch number 2:

Sketch number 3:
Sketch number 4:

![Sketch number 4 diagram]

Sketch number 5:

![Sketch number 5 diagrams]

Sketch number 6:

![Sketch number 6 diagram]
Sketch number 7:

Sketch number 8:

Sketch number 9:
Sketch number 10:

Sketch number 11:

Sketch number 12:
Sketch number 13:

Sketch number 14:
APPENDIX 4. Sketches generated from Morphological Chart Methods.

Sketch number 15:

Sketch number 16:

Sketch number 17:
Sketch number 18:

[Image of a sketch with the text: Cardboard Informative, Film Geometric, A + F + C]

Sketch number 19:

[Image of a sketch with the text: C + F Lid, Tray and box, Inside a box, A + F + C, Lid, Transparent, Tray and box]

Sketch number 20:

[Image of a sketch with the text: Main Food]
APPENDIX 5. Sketches generated from Weighted Objectives Method.

Sketches from combination A:
Sketches from combination B:

- Cardboard structure
  - Cardboard
  - Cardboard representing a fish's head.
  - Hole to make the handling easier

- Microperforated

- Aluminium tray
  - Slot
Sketches from combination C:

- Aluminium tray
- Slot
- Cardboard box
APPENDIX 6. Tray Drawing
APPENDIX 7. Possible clients' opinions.

INTRODUCTION

- The purpose of this survey is to try to collect information about customers' personal opinion of possible clients regarding the acceptance of the packaging in the market.

- Celia García Cobo and José Miguel Campillo Navarro conduct this survey. (Students of HögskolaniSkovde / The University of Skovde).

- All participation in this survey is completely voluntary.

- All collected information will be confidential.

- Completing the survey takes approximately two minutes.
MAIN QUESTIONS

1. Which packaging is more inspiring in order to buy it?
   a. Model 1.
   b. Model 2.
   c. Model 3.
   d. Model 4.
   e. Model 5.
   g. Neither.

2. Which packaging looks more attractive?
   a. Model 1.
   b. Model 2.
   c. Model 3.
   d. Model 4
   e. Model 5.
   g. Neither.

3. Which packaging seems more eco-friendly?
   a. Model 1.
   b. Model 2.
   c. Model 3.
   d. Model 4.
   e. Model 5.
   g. Neither.
4. Which of these aluminium packaging would you prefer to enjoy your meal?
   a. Model 1.
   b. Model 2.
   c. Model 3.
   d. Model 4.

MODEL 1

MODEL 2

MODEL 3

MODEL 4
5. The fish-shape packaging appeals to you...

a. Attractive.
b. Ugly.
c. Innovative.
d. Not appropriate.
e. Childish.
f. Natural.
g. Funny.
h. Others.