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Preface

This thesis is the final phase toward the completion of my bachelor's degree in Information Science. It has been a pleasure working on a project that might help us to live more consciously in this fragile world and it has opened my eyes for issues I had not thought about before.

I would like to thank Sergio España Cubillo for guiding me in this project and always finding new ways for me to keep on working, giving me clear feedback and making me think critically about the things I did.

Also I would like to thank my mother for making sure that this thesis is readable.

Abstract

There is a growing group of consumers that cares about more than the convenience and the price of the products they buy. Specifically, they want to know how they impact their environment with their buying behaviour. One way of enabling consumers to do this is by creating a smartphone application, which allows its users to find information considering the ethical issues related to the products they buy within a few clicks. This thesis has the goal of finding the requirements for such an application. To find these requirements, firstly a thorough analysis of the context and users of the application was performed. After that, existing applications within the context of ethical consumerism were analysed through feature and task diagrams. By using the findings from the context and existing application analyses a questionnaire and interview were created to gain a better understanding of what potential users would like to see in such an application. From the application analysis and potential user input the functional and non-functional requirements specifically related to an application in ethical consumerism were listed. In addition to the requirements and to give a better overview on the proposed design a feature and task diagram as well as an architecture model, entity-relationship diagram, class diagram and navigational model of wireframes were created.

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1 Introduction

It cannot be denied that we, the people living on planet earth, have a great impact on the world we live in. For instance, last year has broken the average global temperature record for a third year in a row (Gillis, 2017; Nuccitelli, 2017), the number and strength of extreme weather conditions, such as heat waves and droughts, have increased (National Climate Assessment, 2017) and child labour is still a thing an estimated amount of 168 million children have to do worldwide (World Report on Child Labour 2015: Paving the way to decent work for young people, 2015). Nowadays more and more people have grown more conscious about their environment and the impact they have on it. As consumers we are constantly using resources from our planet, people and animals in different ways. These resources may be tangible such as water, crops and meat but also intangible resources such as working hours and ways of transportation. Moreover, many products we buy have more to it than the final form we see in our stores. Clothes, for instance, have been sewn at a factory, the fabric has been produced somewhere else and multiple distributors may have relocated the shipment until it is being sold in a store. Oftentimes we are not aware or interested in this and even if we are, it is not easy to find out what resources have been used, how employees were treated and if animals were tested. By being conscious about these matters, a growing population within our society expresses the desire to find out more about the products they buy in order to minimize the negative effects they have on their environment (Global Consumers are Willing to Put Their Money Where Their Heart is When it Comes to Goods and Services from Companies Committed to Social Responsibility, 2014). Unfortunately, there is a disruption between this intention and the resulting measured behaviour. People seem to care about the ethical considerations of products they want to buy but in the end just a small group actually buys them (Cowe and Williams, 2000; d'Astous and Legendre, 2008; Low and Davenport, 2007).

1.1 Consumers and information

It has been found that one of the main factors influencing consumer behaviour is information (Atif et al., 2013). Before making ethical buying decisions the consumer wants to gain knowledge about the product or service he or she might buy. This search for information will be more extensive and thus more likely to lead to a well informed decision if the information is easily accessible (Zander and Hamm, 2010). For most consumers though, this is not even an issue. The price, perceived value, brand image, fashion trends and convenience are the main factors for making buying decisions (Carrigan and Attala, 2001), which has likely not changed over the years. These consumers simply do not care about ethical issues or do not have the resources to do so. The following figure, which

is adapted from Carrigan and Attala (2001), illustrates the different groups of consumers based on their characteristics concerning ethical attitudes.

		Ethical Awareness	
		High	Low
Ethical Purchase Intention	High	Caring and Ethical	Confused and Uncertain
	Low	Cynical and Disinterested	Oblivious

Figure 1.1 Ethical attitudes of potential consumers

The consumers that would be categorized in the bottom of the matrix either do not have the resources to consume ethically (oblivious), think that their consuming behaviour does not make a difference or do not believe that companies really are ethical (cynical and disinterested). The consumers corresponding to the top of the matrix actually do have the intention of buying ethically, but often encounter problems in doing so due to a lack of information, misinformation or information overload.

1.2 Solving the desired information problem

For aiding the group of consumers in the top of the matrix from figure 1.1 in their decision-making, applications, websites, browser extensions etc. are readily available. They offer services in different ways such as, scanning products for information, show protest groups to join or engaging the user in behaving ethically. Some of these applications to their job very well, some do it less, but from each one, lessons can be learned. By looking at what technologies exist to aid ethical consumers and what ethical consumers want, the goal of this research project can be defined. The goal will be to find the best way for an application to help ethical consumers in making informed decisions about ethical products or services they intend to buy, which is stated in the following research objective: **What are the requirements for the best mobile application for aiding consumers in ethical decision-making?**

1.3 Research questions

Answering the main objective at once is impossible; hence it is unavoidable to divide this question into multiple research questions. Doing this gives us the opportunity to gain a better understanding of the domain in which the application will be operating, finding out what potential users see as important and what already has been done within the context of ethical application design.

For the purpose of finding an answer to the main objective, three research questions are proposed. The first one focuses on understanding the context in which the application will be used:

- *RQ1. Which concepts of importance can be found within the domain of ethical consumerism and what do they mean?*

This research will also look at the existing catalogue of applications within the domain of ethical consumerism for either identifying requirements or finding out if they serve their purpose well and if there may be improvements:

- *RQ2. Which applications on ethical consumerism exist, what is their availability and how do they work?*

The final question is focusing on finding requirements that are considered essential by either potential users, the existing literature or have been identified through analysing the existing applications:

- *RQ3. What requirements would a future application need to enable consumers to make informed ethical decisions about the products or services they buy?*

1.4 Research methodology

To structure this research project the design cycle presented by Wieringa (2014) will be partly used. The complete design cycle consists of four phases, namely problem investigation, treatment design, treatment validation and treatment implementation. However, for the purpose of this research project only the first three phases will be used.

During the problem investigation phase as much information related to the main objective will be gathered. Conceptual frameworks will be established and the stakeholders of the application together with their goals will be identified. The information for this will come from the existing literature within the context of ethical consumerism. Once this investigation has been completed the first research question can be answered.

The next phase will be about designing the treatment to the problem stated in section 1.1. During this phase existing treatments (e.g. applications) will be analysed and potential users will be questioned through a questionnaire and interviews. These methods should result in the requirements that are specifically required for creating an application that contributes to the stakeholder goals specified during the problem investigation. Furthermore, first models for designing the solution will be proposed in order to give better insights in the vision of the data management and look of the proposed application. After this phase RQ2 and RQ3 can be answered.

Finally a brief discussion will be provided considering the validation of the proposed application. In addition to this, a matrix will be presented, which shows for each existing application to which degree the found requirements are implemented.

1.5 Process deliverable diagram

The proposed structure this project will be graphically represented in a process deliverable diagram (PDD). A PDD is a way of representing activities and its deliverables in the form of a combined process- and deliverable diagram (van de Weerd and Brinkkemper, 2008). The following figure shows an example PDD, which is adopted from van de Weerd and Brinkkemper (2008).

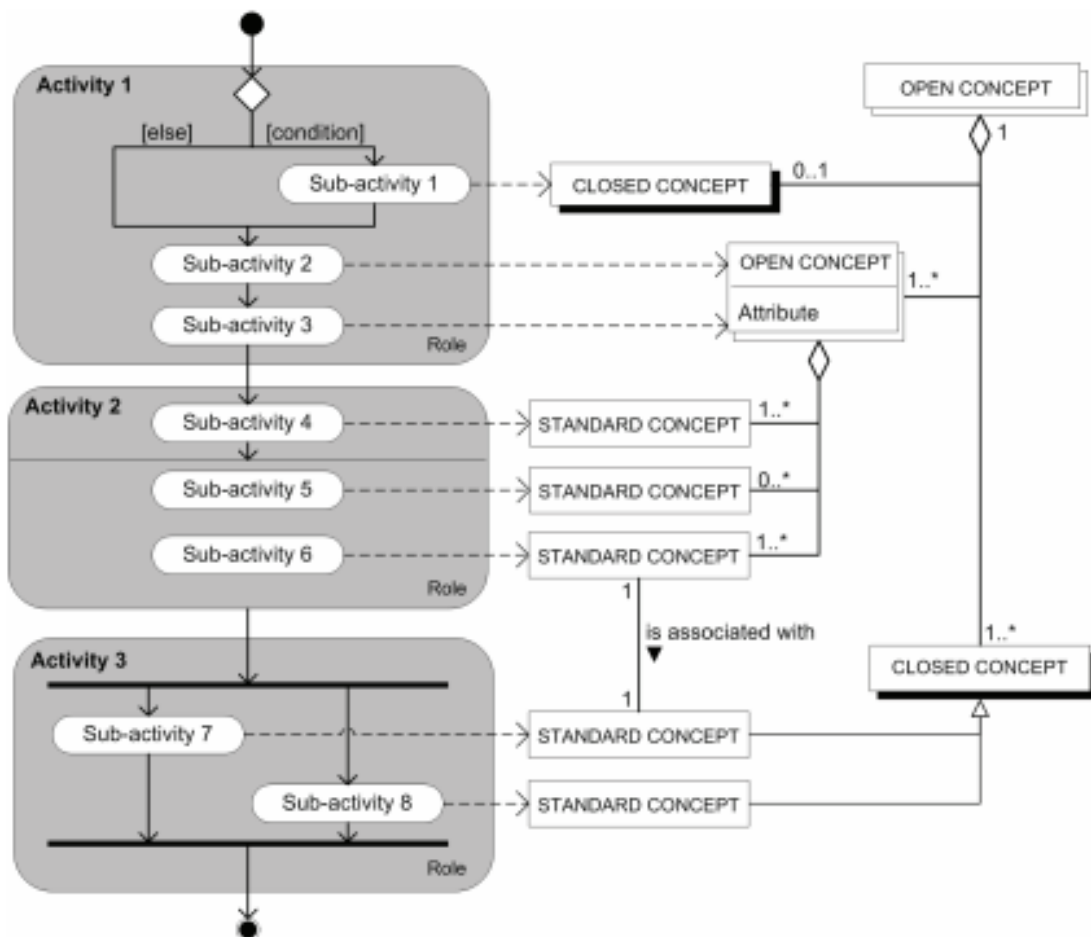


Figure 1.2 Example PDD

From the example above one can see that the left side is based on the Unified Modelling Language (UML) activity diagram, in which main activities can be divided into sub-activities. The process diagram is linked to the deliverable diagram by dotted arrows. Each arrow points to one or multiple concepts that are the result of the activity it question. The deliverable diagram is based on the UML class diagram. A concept is a simplified UML class and may be standard, open or closed. A standard concept contains no other concepts and may show the attributes that belong to the concept. An open concept is a concept with expanded sub-concepts and a closed concept is a concept without expanded sub-

concepts since they are not relevant in the context. Furthermore, the UML relations of generalization, association and aggregation are used between the concepts together with the multiplicity between the concepts and verbs and triangles describing the association and direction of reading.

Now, the following figure shows the PDD for this research project. To ensure a better visibility all concepts are closed now, but once the reader arrives at the section of the document relevant to the concepts the part of the PDD with the expanded concepts will be shown.

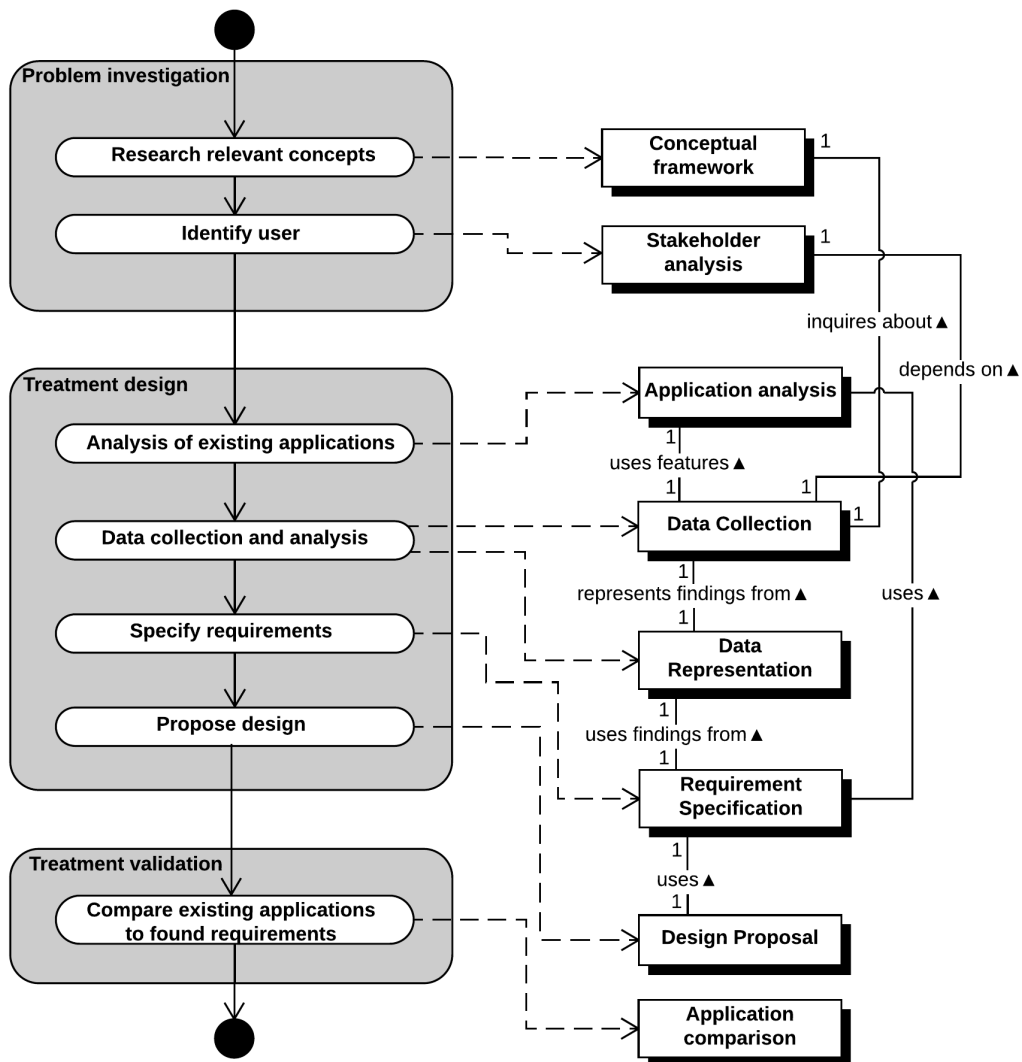


Figure 1.3 PDD for finding and assessing the requirements for an application on ethical consumerism

2 Problem Investigation

This chapter will introduce an elaboration on the theoretical background that is related to ethical consumerism. Firstly a conceptual framework will explain the relevant concepts to this branch of consumerism and secondly, a detailed analysis of the potential users will be presented. Figure 2.1 shows an overview of this process.

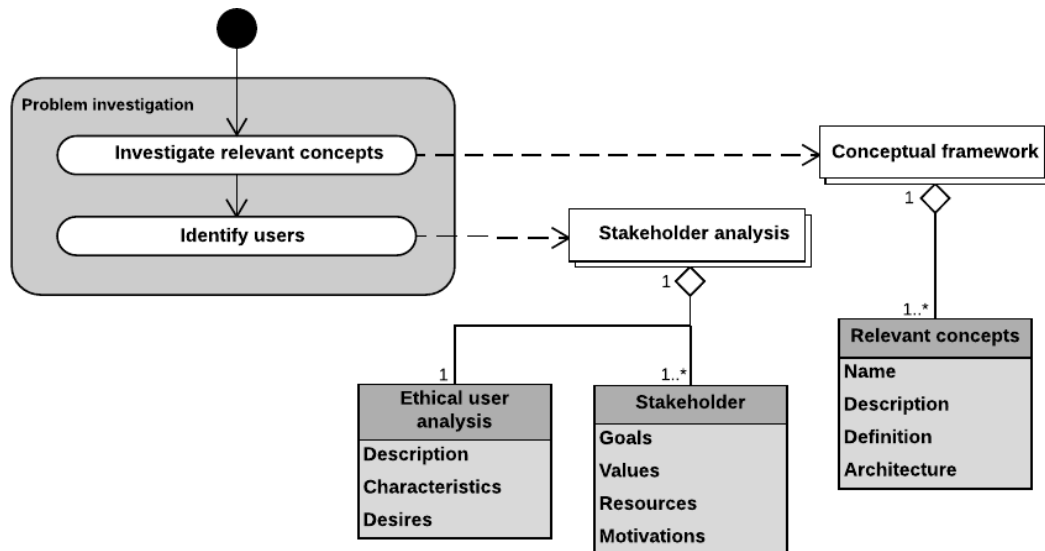


Figure 2.1 PDD for the problem investigation

2.1 Ethical consumerism

The first concept that needs to be explored is ethical consumerism or ethical consumer behaviour (Bray et al, 2010; Sudbury and Kohlbacher, 2016) itself. What does this concept mean? When is a product considered ethical?

Firstly, the meaning of the words 'ethical' and 'consumerism' must be clear. As can be found in the Oxford dictionary, being ethical is best defined as "Relating to moral principles or the branch of knowledge dealing with these" (as seen on www.oxforddictionaries.com) in which being moral is described as "[being] Concerned with the principles of right and wrong behavior". Subsequently, consumerism is best defined as "The preoccupation of society with the acquisition of consumer goods." (as seen on www.oxforddictionaries.com). Moreover, Bray et al. (2010) define ethical consumer behaviour as "decision-making, purchases and other consumption experiences that are affected by the consumer's ethical concerns".

From these definitions it is evident that ethical consumerism is related to making choices in consideration with one's personal beliefs about the goods or services that are being acquired. An important thing to note here is that these personal beliefs differ for each individual: what person A believes to be ethical is not necessarily what person B believes to be ethical. Hence, the definition of ethical consumerism within the context of this research project requires a more precise definition of what ethical behaviour consists of.

Much research has been done on this topic but it is mainly focused on the ethical consumer himself. This means that there are not many clear definitions, but the researches indicate certain aspects that should be considered in defining ethical consumerism.

The first aspect that almost includes every research is the one addressing environmental issues. Using eco-friendly techniques (Cotte, 2008), incorporating the consideration of ecological issues (Sudbury and Kohlbacher, 2016) and recycling (Kim and Choi, 2005) are just a few examples of environmental issues that are being discussed in the existing literature.

The second aspect is related to social and human welfare issues. Within the context of ethical consumerism these issues are mainly related to the treatment of employees and manifest themselves in the declaration of human rights. In the declaration it is stated that employees have the rights to free labour choice, equal pay for equal work, a fair salary and the rights to form or join workers unions (The United Nations, 1948). This declaration is the very basis and many other aspects of human welfare exist additionally, such as elimination of child labor and ensuring a safe working environment.

The third aspect of ethical consumerism are animal welfare issues (Cowe and Williams, 2000). These issues are related to the treatment of animals, such as testing products on animals or feeding antibiotics to battery hens (Low and Davenport, 2007).

To finalize this, figure 2.2 gives an overview of the three aspects of ethical consumerism, which is also called the triple bottom line of ethical consuming. The figure is adopted from Low and Davenport (2007).

Now that it is clear what ethical consumerism consists of it can be defined within the context of this research project. For this Bray et al.'s definition from the beginning of this section will be extended. Thus, the definition for ethical consumerism will be: *“Decision-making, purchases and other consumption experiences that are affected by the consumer's ethical concerns, which are related to environmental, social & human welfare and animal welfare issues.”*

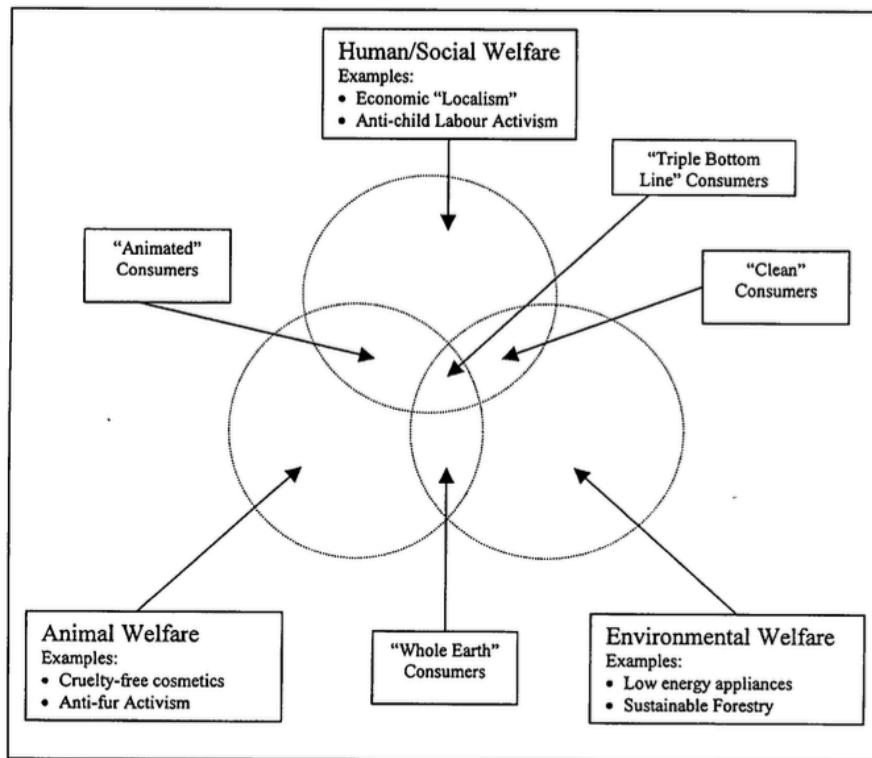


Figure 2.2 Overview of aspects in ethical consumerism [Low and Davenport, 2007]

2.2 Ethical consumer decision-making

The definition stated in the previous section brings forward a new question, namely how do consumers make a decision to buy a product they consider being ethical? The research in this brings forward a well-documented concept, which is the theory of planned behaviour (TPB) (Ajzen, 1991). The TPB has been used to derive ethical decision-making models from (Chatzidakis et al., 2007), which will be discussed in this section. However, predicting behaviour from these models is rather delicate because of the attitude-behaviour gap. The attitude-behaviour gap refers to the disruption found between consumers' intention to buy ethical products and the actual amount of ethical products being sold (Cowe and Williams, 2000; Bray et al., 2010; d'Astous and Legendre, 2008). Thus, models for the ethical decision-making have to be viewed critically (Carrington et al., 2010), but can certainly contribute to the understanding of the behaviour of the consumers that ultimately do consume ethically.

The TPB states that there are three determinants of intention or "factors which decisively affect the outcome of the intention" (as derived from www.oxforddictionaries.com). These factors, or attitudes, as listed below lead to an intention that ultimately results in a certain behaviour:

- The **attitude toward the behavior** refers to 'the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behaviour in question.' It is about the beliefs an individual has about the behaviour's outcome, whether they are positive or negative. These *behavioural beliefs* about the consequences of the behaviour and

additionally the individual's evaluation of those consequences result in the attitude towards the behaviour.

- The **subjective norm** refers to 'the perceived social pressure to perform or not to perform the behaviour.' This attitude is also related to beliefs, namely the beliefs one has about what others' (e.g. partner, friends, doctor) opinion is about the behaviour in question and hence, if he/she should perform that behaviour.
- The **perceived behavioral control** (PBC) refers to 'the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated impediments and obstacles.' This attitude will be elaborated later in this section.

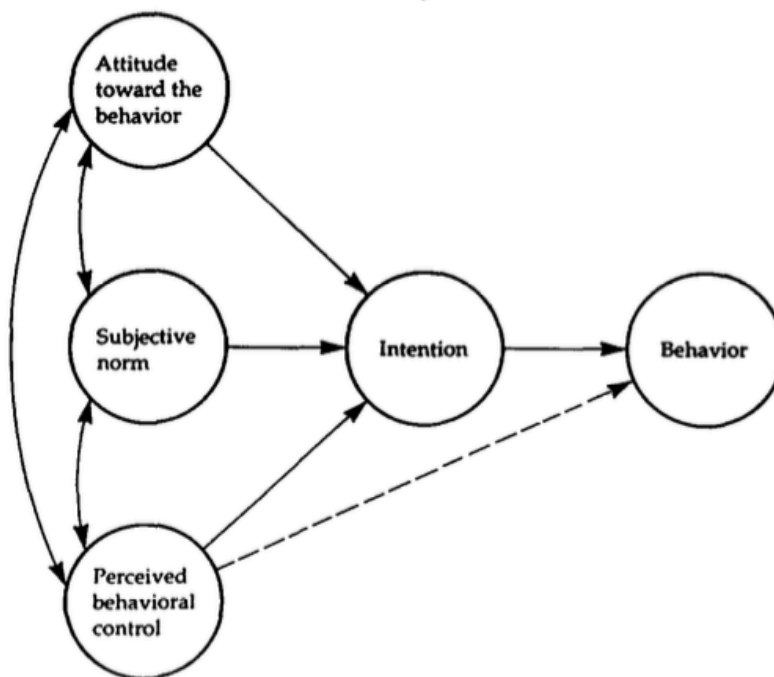


Figure 2.3 Model of the theory of planned behaviour [Ajzen, 1991]

More recent research within the context of ethical consumerism has yielded models based on the TPB (Chatzidakis et al., 2007; de Pelsmacker and Janssens, 2007). Shaw et al. (2000) have expanded the model by adding two more attitudes, which are ethical obligation and self-identity. The **Ethical obligation** refers to an individual's cognitive ethical rules and it reflects his or hers subjective norms about right and wrong. The **self-identity** predictor affects the intention from the moment that an ethical issue becomes an important part of an individual's self-identity (e.g. becoming a vegetarian, because of the way animals are treated). Additionally, de Pelsmacker and Janssens (2007) argue that **knowledge** about fair trade (FT) products (i.e. information about FT, attitude towards FT and attitude towards FT products) influences the intention as well.

Now there are five factors influencing the ethical intention and behaviour, but they do not completely explain the resulting behaviour (Chatzidakis et al., 2007). Due to the attitude-behaviour gap, Chatzidakis et al. have researched the role neutralisation has in influencing the transition of intention to actual behaviour. Neutralisation can be defined as ways of justifying undesirable behaviour and help people to free themselves of blame from themselves and others. Within the context of ethical consumerism Chatzidakis et al. (2007) have used the following five techniques to identify this behaviour:

1. Denial of responsibility. The behaviour occurred because of circumstances beyond the offender's control. "It's (i.e. FT products) expensive and money is tight right now."
2. Denial of injury. The offender argues that no harm is done by the behaviour. "I think the problem is too big to be dealt with at the level of the consumer."
3. Denial of victim. The offender argues that the victim deserved what happened to him/her. "It's their fault; if they had been fair with me, I would not have done it."
4. Condemning the condemners. The other party is being condemned by pointing out they were not any better. "You were just as bad in your day".
5. Appeal to higher loyalties. The offender argues that he/she did it for the greater good. For instance helping a family member or friend.

Here it is important to note that these techniques are not only used for justifying actions after they have happened. Many times they are applied beforehand. The following figure shows the position neutralisation takes in influencing the behaviour of consumers.

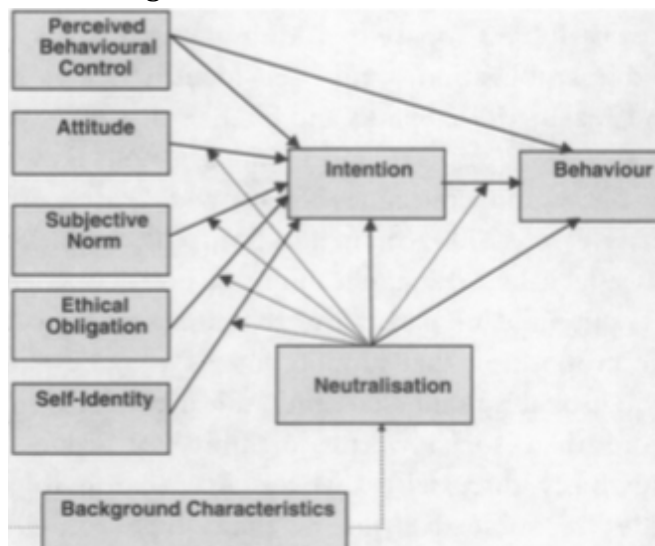


Figure 2.4 Influence of neutralisation on decision-making [Chatzidakis et al., 2007]

In addition to the cognitive attitudes that influence the ethical decision making, there are external factors influencing the behaviour as well

(Carrington et al., 2010). These factors apply after the intention of buying ethically has been made and Carrington et al. call this plan of bringing the intention into action the implementation intentions. It basically is an if/then plan, which every consumer creates for him- or herself. It is a plan that specifies when, where and how an intention will be translated into actual behaviour (e.g. “if I need eggs, I will go to the supermarket and buy free range eggs”). These implementation intentions are being challenged by the external factors ‘**Actual behavioral control**’ (ABC) and ‘**Situational context**’ (SC). **ABC** can be specified as the capability someone has to carry out a behaviour. This capability is depending on the individual’s belief of having the external control and internal ability of performing the intended behaviour. Within the context of this research the ABC is a replacement for the PBC predictor. The reason for this is that the PBC is a predictor that often has been found to not reflect the ABC (Carrington et al., 2010). The reason for this is that the PBC is based on imagined scenarios, which often do not reflect reality. This results in consumers thinking that they are able to perform a behaviour, but circumstances (e.g. price, no information, product unavailability etc.) occur and the perceived control is nonexistent. Additionally, this difference between imagination and reality is argued to be one of the main reasons for the difference between intention and resulting behaviour that leads to the attitude-behaviour gap. Now, from the attitudes we have seen so far it can be concluded that, before shopping, consumers have a certain idea of the experience in mind. This experience, however, does often not reflect the actual social and physical environment they enter. For example, one decides that new eggs should be bought and they have to be from free ranged chicken. However, at the supermarket there’s a huge flashing sign saying that the regular eggs have a “Buy 2 pay 1” highly lucrative discount. Hence, the factors beyond one’s control that influence the person’s behaviour, the **situational context**, must be taken into account. Hereby it has to be noted that the SC can block but also facilitate the translation of the implementation intentions to ethical behaviour.

To summarize this section, a model has been created that incorporates the discussed attitudes that affect the ethical decision-making. The five attitudes influencing the intention are depicted on the left side within the cognitive context. The resulting intention has influence on the consumer’s behaviour but does not completely predict it, since it is being influenced by the two external factors SC and ABC. Furthermore, four determinants of the intention, the intention itself, ABC and the resulting behaviour are challenged by the neutralisation techniques.

The model is adopted from the papers that discussed the attitudes. Naturally, it is just a simplified model of the complex process of decision

making but it is a good way of giving an overview of what attitudes influence ethical consumers' behaviour.

To make this model more concrete we give an example of how a consumer decides to perform a certain behaviour. Imagine a woman needs to buy a few clothes. She is aware of issues related to the production of clothes, such as exploited employees in nations with low labor costs (e.g. Bangladesh, India) and mistreatment of animals, and thus has some knowledge about the product. Furthermore, she identifies herself as someone who cares about the treatment of animals and feels obligated to buy clothes that have not used any form of mistreatment of animals during production. Furthermore, she believes that buying ethically produced clothes will lessen the amount of exploited employees and abused animals and help the store that sells these clothes to survive and enable consumers in town to buy ethically as well. While this woman is going to the store she does see sales of other stores with less responsible clothes; they are quite tempting but she has opted to have fewer clothes which, she can wear without having to think about the consequences they have.

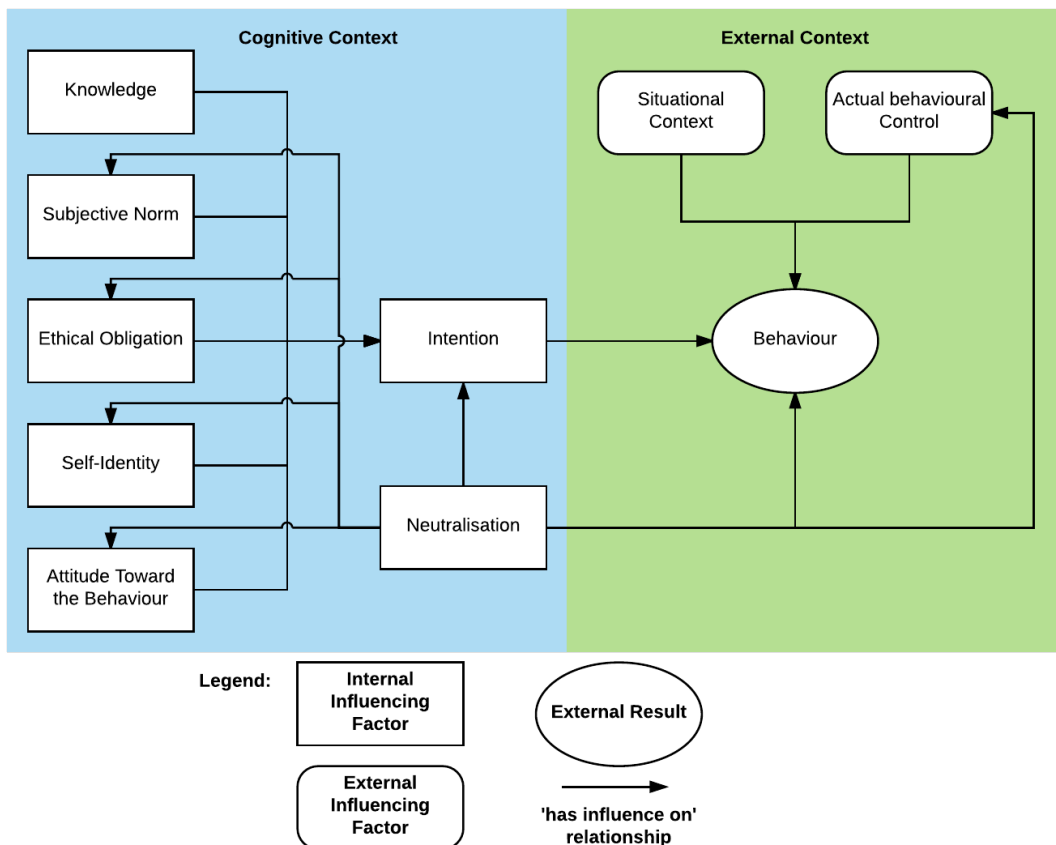


Figure 2.5 An adapted model of the ethical decision-making

2.3 The ethical consumer

Now that it is clear what ethical consumerism and decision-making consists of it should also be clear whom the people are that consume ethically. As has been stated before, when asked, many people are concerned about ethical issues but

in reality not many actually turn this into action (attitude-behaviour gap). The goal of this project is to find the requirements for an application to aid the group of people who actually engage in ethical consuming. This group is very diverse and includes people with a huge variety of characteristics, such as age, gender, resources, motivations and goals.

As has been stated in the previous section, being ethical is very much depending on the individual. Some people have an, as Low and Davenport call it, 'absolute ethical bottom line'. This means that some ethical consumers may just go as far as being considered about animal welfare, while others take multiple factors into account and would be classified as "clean consumers" for instance (Low and Davenport, 2007). Having an absolute ethical bottom line also introduces conflicts. Some ethical practices clash, examples of this would be organically grown food in a third world country but the people growing it are not paid accordingly or locally raised and butchered hens with a low transport impact who have not been treated well. Furthermore, there is another group of consumers do not seem to care about the ethical issues at all and use ethical products only as a status symbol (Griskevicius et al., 2010).

Independently on which category an individual would identify with, there are underlying values that motivate the ethical consumer, since he buys ethical products and services with a certain value-related goal in mind (Freestone and McGoldrick, 2007). Schwarz (1992) has identified many values that motivate people and categorized them in to eleven groups: Self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, spirituality, benevolence and universalism. However, these values have been mainly applied within political and social research (Shaw et al., 2005). The importance of these values in ethical decision-making is unclear within Schwarz' context but Shaw et al. (2005) have found value types that contribute significantly to the ethical decision-making. The research has resulted in a list of values that the research's participants considered to be important and unimportant guiding principles while shopping for groceries.

The important values are of the following types: self-direction, stimulation, achievement, hedonism, security, benevolence, universalism and conformity. Of these value types a few individual values that are considered especially important to the goal of this paper will be elaborated.

Freedom (freedom of action and thought) refers to the consumers having no constraints in their behaviour (i.e. grocery shopping). Being able to make your own buying decisions is highly appreciated but marketing actions of mainly large organizations are challenging this value. Another aspect to this value is the availability of ethical products. Since it is sometimes difficult to buy certain products (e.g. no ethical products at local supermarket) consumers have the feeling of being limited in their freedom.

Curious (interested in everything, exploring) is mainly about the interest consumers have in the product they buy. They want to know where it is from,

how the people producing it were treated, if genetically manipulated crops were used etc.

Influential (having an impact on people and events) is an important value since the end goal of consuming ethically is to make a positive impact on the world for most consumers. Therefore consumers want to know what impact the products they buy have.

Self-discipline (self-restraint, resistance to temptation) refers to the difficulties ethical consumers experience while shopping due to the availability of easier options for the same product (e.g. cheap milk in supermarket against fresh milk from local farmer). This is also supported by Hughner et al. (2007).

By looking at these values one main attribute can be identified, namely information. Ethical consumers want unbiased information about their possibilities, the products themselves, where to buy them and what impact the products have for making a just and conscious decision (Carrigan and Attalla, 2001; Atif et al., 2013). Also, Carrigan and Attalla argue that this information should be communicated in user-friendly way, which I believe still holds today. Furthermore, this need for information is not only true within the context of grocery shopping (Valor, 2007).

Another aspect of the ethical consumer is having the economical resources. One of the main justifications of consumers' unethical behaviour is economic rationalism (d'Astous and Legendre, 2008), which is expressed by consumers wanting to get the most value out of their money (Eckhardt et al., 2010). Ethical products often have a higher price than their less ethical counterparts or are less effective and efficient, but consumers that consider themselves ethical are willing to pay the price (Zander and Hamm, 2010). These consumers are more often part of the older generation (Hughner et al., 2007).

In conclusion, the ethical consumer is someone that is taking environmental, social, human and animal welfare issues into account while buying a product or service. He or she wants to be informed about the product, know what impact the product has and where it is available. He or she also values freedom of choice highly. Finally most of the ethical consumers do have the required funds and are willing to pay premium prices for the products they consider being ethical.

2.4 Stakeholders

The stakeholders for the application can be split into two groups, namely stakeholders related to the ethical consumer and other stakeholders. The latter group would consist of designers, application developers, product owners and basically any entity related to application development within ethical consumerism except for the consumers. Since the goal of this project is to find the requirements for an application, only potential users will be involved in the search and the other stakeholders will not be discussed any further.

On the other hand, the ethical consumer, as he is described in section 2.3, is and will be directly involved in finding the requirements. This group of stakeholders can be roughly divided into two groups:

- Group 1. This group of ethical consumers do buy ethical products, but not because of the ethical reasons. Perhaps they have something against the brand, use the product for status, think the products are healthier or contribute to any other personal goal. This group wants to get informed about the ethicalness of a product in a quick and convenient way without too much elaboration on all the ethical aspects of the product
- Group 2. This group of ethical consumers do buy ethical products because these products contribute to one or more ethical issues. By buying an ethical product these consumers want to accomplish some kind of goal that is related to the environment, social welfare and/or animal welfare. As has been discussed before, each individual within this group may have different goals and motivations, but most people have some knowledge about this topic and want to get more detailed information for the issues they find important.
- Group 3. This group of ethical consumers are technically seen not ethical yet but have the intention to be so. Consumers in this group have decided for themselves that they would like to buy more responsible products and will use the application as a tool for finding out more about the products they are buying frequently or want to buy.

2.5 Conclusion

This chapter introduced the main concepts related to ethical consumerism. It is the base upon which the rest of this research project will be build and hence, the concepts must clearly stated. Through the extensive literature review we now understand what is meant by ethical consumerism, how the ethical consumers makes decisions and who the ethical consumer and hence, the potential users of the application, are.

From these concepts there are a few takeaways. Firstly being ethical can be defined as caring about the environment, human welfare and animal welfare but this definition cannot be applied on the actual consumers. Namely, being ethical is very much dependent on the individual beliefs of each consumer. Furthermore, some consumers have a big desire for much information, while others just want to get informed quickly and others consumers may be looking for specific pieces of information. Therefore, we have to keep in mind while designing the application that these different demands should be catered for.

To finalize this chapter, Wieringa (2014) has proposed a template for design problems, which, when filled in, shows how the goal of the stakeholders will be achieved. Thus, this research project aims to:

- Improve *the availability of ethical information about products*
- *by proposing an application design*
- *that satisfies the need for specific information by different consumer groups*
- *in order to aid consumers in making informed decisions about the products they buy.*

3 Treatment Design

With having a clear context for the application it is now time to shift the attention toward finding the requirements. To find out what the application should do exactly, different techniques will be applied. Firstly, existing applications will be analysed in different ways. Secondly, potential users will be questioned through the use of a survey and interviews. Based on the outcome of these techniques, the requirements will be stated. Additionally, we will show a few wireframes of screens of the potential application to show how certain functions of the application will be realised.

3.1 Analysis of existing applications

Numerous applications for the purpose of aiding consumers in behaving ethically exist. Each of these applications has been designed, which means that people have put thoughts into what functions it should have. Thus, to be able to gain knowledge about the requirements needed for the application in this project, a thorough examination of existing applications is necessary. By analysing existing applications, possible future requirements can be found and missing features may be identified through combining the result of the analysis with research data.

The applications have been found through a search engine search for organisations that care about ethical issues (e.g. People for the Ethical Treatment of Animals (PETA) and the Environmental Working Group (EWG)) and searching the Android Play Store for ethical applications and going through the alternatives proposed by the Play Store. From the results of this search, every application, which gives information about products or producers, has been selected. For each application a description, feature model and task model have been created as can be seen in the PDD in figure 3.1. This gives a good overview on the background of the application, which functionality it has and how users navigate through it. For creating the diagrams only the android versions of each application have been used.

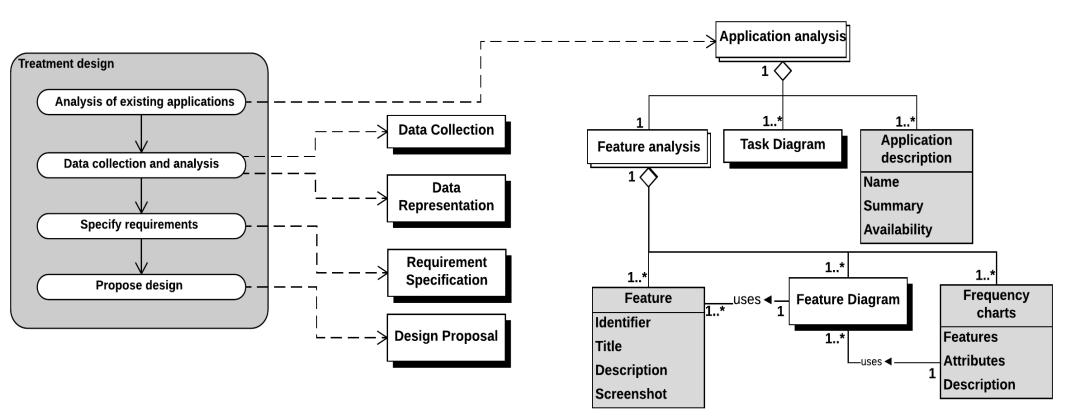


Figure 3.1 PDD for the application analysis

3.1.1 Introduction of applications

GoodGuide

GoodGuide is an application that shows the consumer a product rating on a 0 to 10 scale for the product's health impact. This information is shown after scanning the product's UPC code or a manual search in the database. The data for this has been acquired from over 1000 different sources according to GoodGuide. This service is available to US products only.

Bunny Free

This application, developed by PETA, lets you check if products have been tested on animals. Like the GoodGuide app, it is possible to either scan or search for products and brands. Unfortunately, only North-American information is available.

Boycott

Boycott is an application in which one can join campaigns to support certain causes. By scanning or looking up products you can see how the product matches your principles by seeing to which campaigns it is related. The application also gives information about the company creating the product and basic information about the product itself. This application allows campaigns from all over the world to be added.

Questionmark

This comprehensive application gives the opportunity to consumers to check for many products, either by scan or search, what the ethical score is on a scale from 0 to 10. It shows what the individual scores are concerning environmental, animal welfare and human rights issues and their weighted importance can be adjusted. Also it gives additional product information, such as an indication of the product's healthiness, the ingredients, nutritional values and alternative products. This application is only available in Dutch.

Groente- en Fruitkalender

This application is focused on the fruit and vegetables that are available to consumers in the Netherlands. By searching manually it shows for each type of fruit or vegetable its environmental rating per month, ranging from A (most environmentally friendly) to E (least environmentally friendly). The ratings take factors into account, such as, country of origin, greenhouse usage and amount of packaging material. This application is only available in Dutch.

VISwijzer

The VISwijzer is an application that gives a rating to many types of fish available. The rating is mainly focused on way of fishing or how the fish is grown and if the characteristics of the fish are in line with the way its being caught. The app rates the fish in a colour scheme from green (good fish), yellow (2nd choice) to red (avoid). Additionally, a blue mark indicates that certain certificates are available. This application is only available in Dutch.

Cruelty Free

This application is developed by the Coalition for Consumer Information on Cosmetics (CCIC). It shows for products and companies, which can be found by scan or search, if they meet the animal-friendly standards proposed by the CCIC. This application is, like the Bunny Free app, focused on North-American products and brands only.


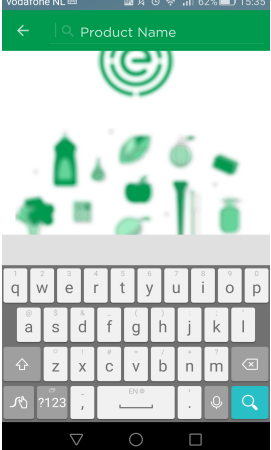
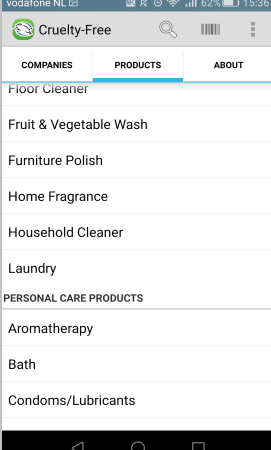
Healthy Living



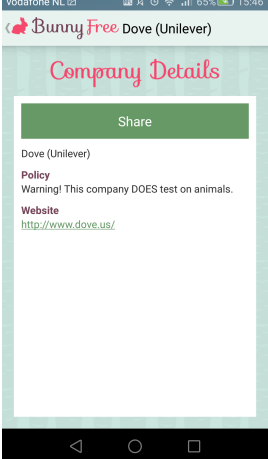
Healthy Living is an application from the EWG. It rates food and personal care products on a scale from 1 to 10 based on nutrition, ingredients and the degree of processing. The products can be found by scanning the UPC code or a manual search. This application is focused on products available in the United States.


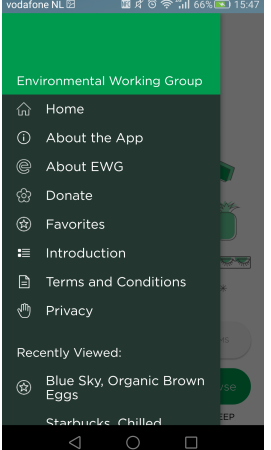
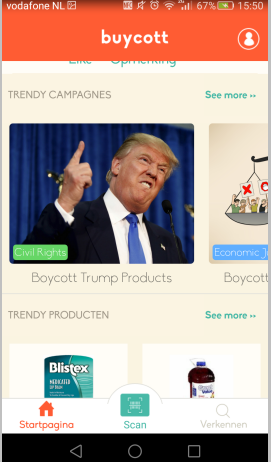
3.1.2 Feature analysis

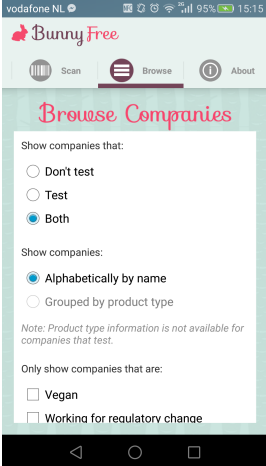
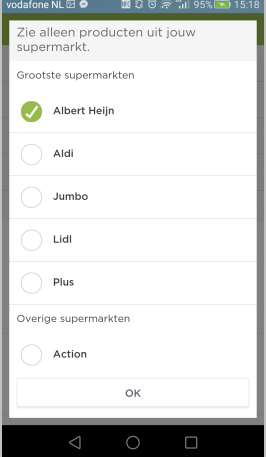
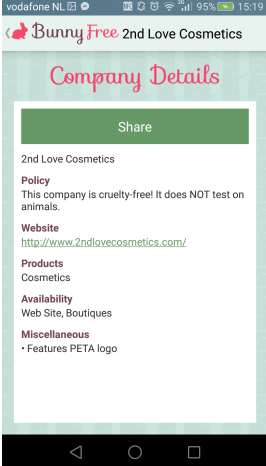
All of the applications from the previous section contain certain features, which is a “prominent or distinctive user-visible aspect, quality, or characteristic of a software system or system” (Kang et al., 1990). With having this definition in mind a number of important features within the applications have been identified. By analysing the features used in the existing applications important and less important features will be identified by looking at the frequencies within the applications. Furthermore, this analysis will create input for the questionnaire and interviews in which potential users will be asked about their opinion on certain features. However, since there is a vast amount of features in each application, only the features relevant to an application for ethical consumerism have been described. The following table lists these features including a description and screenshot off the feature in an existing application.

Table 1 Identified features

ID	Title	Description	Screenshot
F1	UPC Scan	<p>This feature enables the user to scan the UPC code on the product's package to quickly gain access to the information about the product. Most scanners also have the possibility to type in the UPC code manually.</p>	
F2	Database Search	<p>This feature allows the user to search the application's database. Some applications give the possibility to filter the search or sort the list of results on certain attributes.</p>	
F3	Browse	<p>This feature allows the user to browse through certain lists of attributes, such as product categories or companies that meet certain requirements.</p>	

ID	Title	Description	Screenshot
F4	List of Matches	This feature is a result of a UPC Scan, Database Search or Browsing and gives a list of matches that match the specified search criteria.	 <p>The screenshot shows a search interface on a mobile device. At the top, there's a search bar with 'FOREL' entered. Below it, two search results are visible: 'Forel, Regenboog' and 'Forel, Regenboog (biologisch)'. A keyboard is open at the bottom of the screen.</p>
F5	Product Information	For the applications that are about products, this feature shows all the relevant information about that product. This includes general information, but also detailed information or links to relevant attributes.	 <p>The screenshot displays a product information page for 'Blue Sky, Organic Brown Eggs'. It features a bar chart titled 'Find better-rated "Fresh Eggs" products' with a scale from 1 to 10. Below the chart are three circular gauges for 'Nutrition Concern', 'Ingredient Concern', and 'Processing Concern'. A 'Top Findings' section is also visible at the bottom.</p>
F5.1	Company Information	This feature is a sub feature of F5. It is a feature for applications that give information about companies and brands instead of products.	 <p>The screenshot shows a company information page for 'Bunny Free Dove (Unilever)'. It includes a 'Share' button, the company name 'Dove (Unilever)', a 'Policy' section with a warning about animal testing, and a 'Website' link to 'http://www.dove.us/'.</p>

ID	Title	Description	Screenshot
F5.2	Campaign Information	This feature is a sub feature of F5. It is a feature that gives information about campaigns people can join or relate products to.	
F6	Information about the App	This feature gives some general information about the application and the company behind it. Most of the times this feature is divided into sub-features, such as contact information, terms & conditions etc.	
F7	Homepage	The homepage features social aspects of the application. It shows recent activities of users and trending topics.	

ID	Title	Description	Screenshot
F8	Sorting	This feature allows the user to arrange the results of the search by a certain criterion, for instance by alphabetic order or based on the product rating.	
F9	Filter	This feature allows the user to only see the search results that are of interest to the user based on one or multiple criteria, such as brands or ingredients.	
F10	Social Features	This is a group of features, which includes features such as login, find/search friends, share etc. but also adding relevant information to the product information (crowdsourcing).	

Additionally, a feature-diagram for each of the applications has been created, which represents the implementation of features within each application. Traditionally there is no distinction between features in feature modeling but to gain a better understanding on the nature of the features we have decided to distinct between three types of features:

1. Regular feature. This is a feature as it has been defined in the beginning of this section.
2. Action-based feature. This is a feature that requires the user to perform a certain action on the result of a search, browse or any other kind of activity that enables the user to see a list of results or a specific result page.
3. Attribute. This feature is part of a regular or an action based feature and shows which kinds of options are available for the feature in question.

The following figure shows the feature diagram of the GoodGuide application. In this diagram the feature codes from table 1 have been added to the corresponding feature. The feature diagrams of the other applications can be found in appendix A.

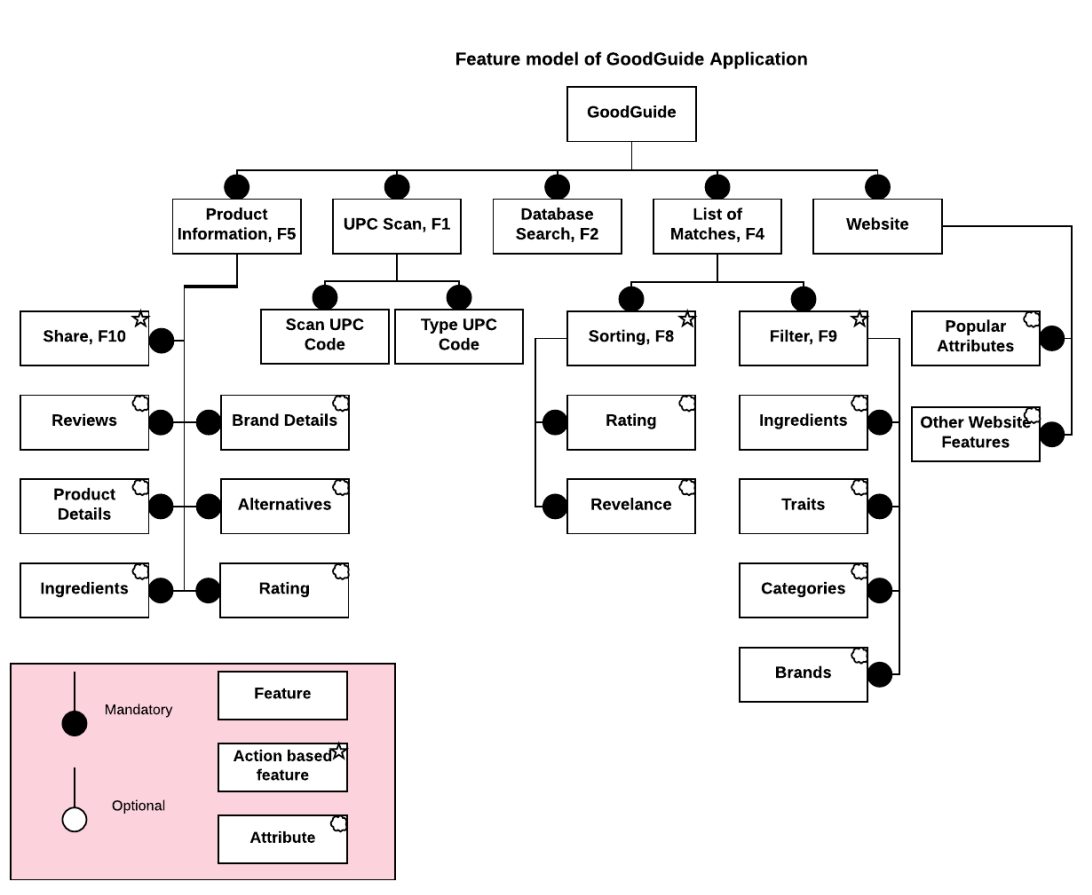


Figure 3.2 Feature diagram of the GoodGuide application

From analysing the features in the diagrams, possible requirements may be identified. This analysis is performed by looking at the frequencies of the features from table 1 within the existing applications. The result of this analysis can be seen in figure 3.3. Through looking at this frequency diagram it will be clear which features are used often and may be important or perhaps there are features that are not used often but are important.

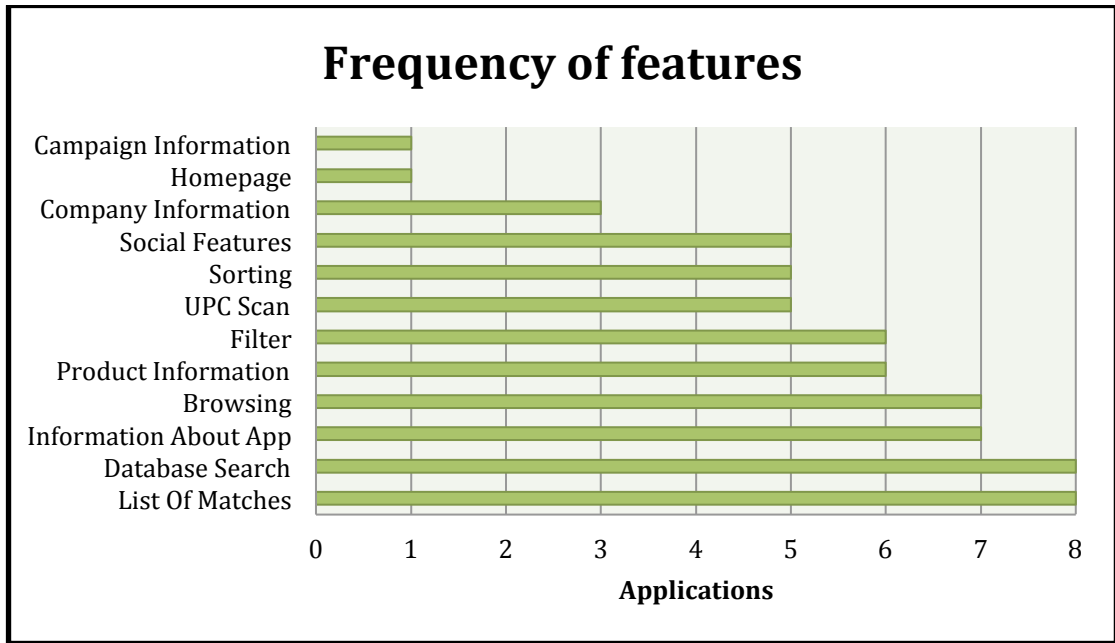


Figure 3.3 Frequency of the features

In addition to the previous diagram, the frequencies of certain attributes or sub-functions of features, such as the UPC scan, sorting and filtering will be shown. This is done for the same reason, namely to create a good overview of the implementations used in the existing applications. The first feature for which this has been done is the UPC scan. Only five out of the eight applications support this function and even fewer enable the user to either scan or type in the UPC manually as can be seen in figure 3.4.

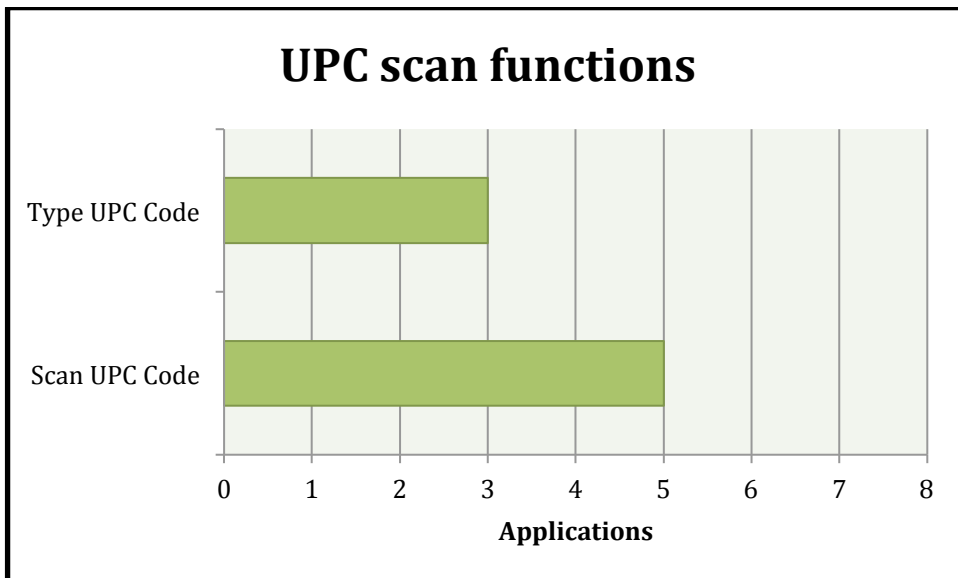


Figure 3.4 Frequency of the UPC scan sub-types

The next feature is the filter, which is a function that helps users to apply an operation on the found data to adjust its representation to what is relevant to the

user. This feature is in most of the applications only applied on the product browsing and is implemented in a different manner, but some applications do filter on the same entities, as can be seen in figure 3.5. Most filters focus on the product itself, such as the brand (company) that produced it, which category it belongs to (e.g. dairy, bakery), the product's ingredients, traits (e.g. gluten free, Fair Trade) or received rating through a certain algorithm. Other filters focus more on the physical location of the user (to enable interaction with users close by) or the availability of the product in certain supermarkets.

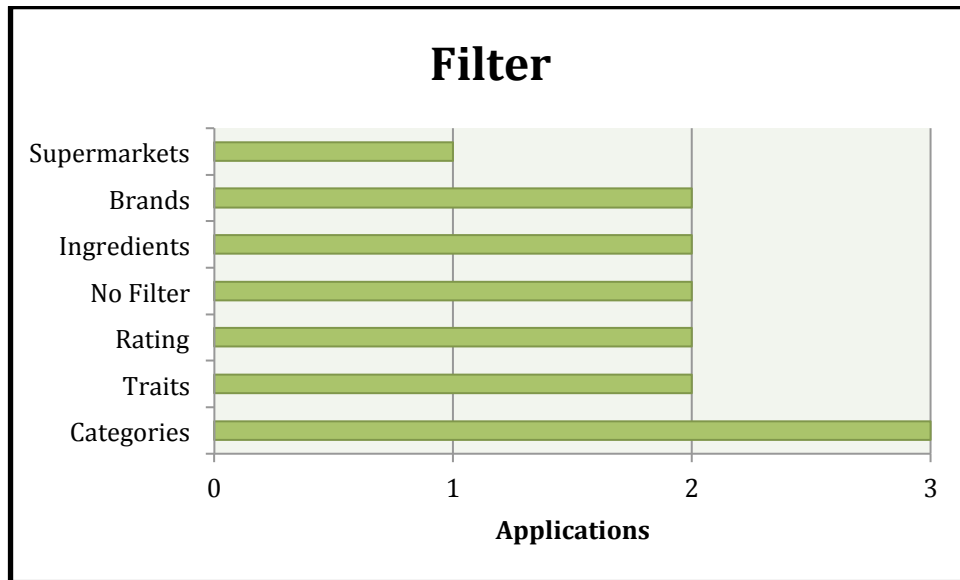


Figure 3.5 Frequency of the filter types

Some applications allow the user to apply another operation on the database search or browsing results, namely sorting. Sorting is the process of arranging data types systematically either by arranging them on a certain trait or grouping types with similar properties. A few applications use the same entity for sorting as for filtering the results, which is a certain kind of rating. These ratings are based on different properties (e.g. sustainability or healthiness) and the algorithms used to create these ratings differ for each application. Moreover, there is one application that allows the user to adjust the weighed importance of the factors of the rating: the adjusted rating. Other types for either arranging or grouping the results can be applied as well and three applications do not support the sorting. Figure 3.6 shows the frequencies of the used sorting types within the existing applications.

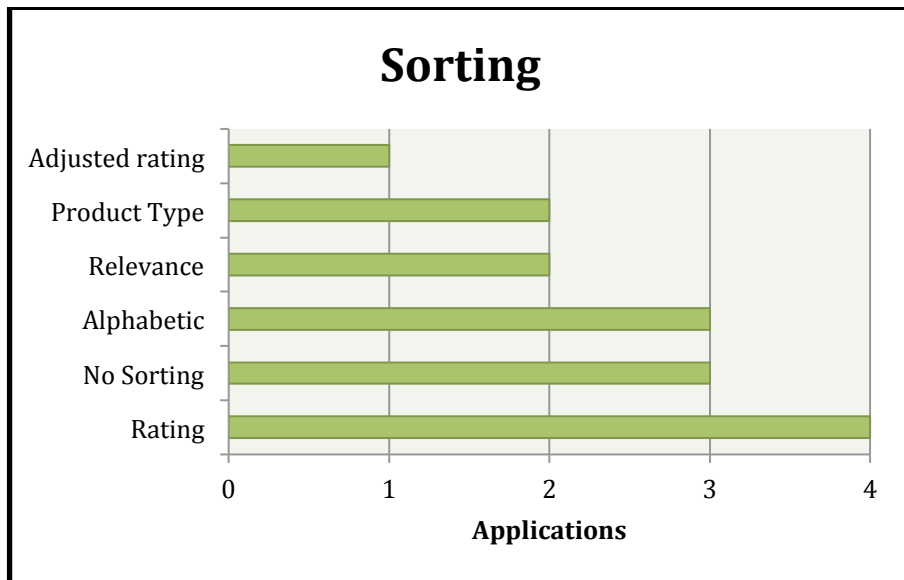


Figure 3.6 Frequency of the sorting types

The final feature that will be decomposed are the social features. This feature receives attention here because of the great influence social media has in many of our lives. However, the real importance of this feature has to be uncovered during the data collection from potential users, since users might experience this feature as irrelevant within the context of ethical consumerism. Figure 3.7 shows that more than half of the applications allow the user to share the found information, for instance through e-mail, social media or chat applications. Other applications allow the user to create a personal account to enable extra functionalities such as showing friends' activities or adding content to the information page.

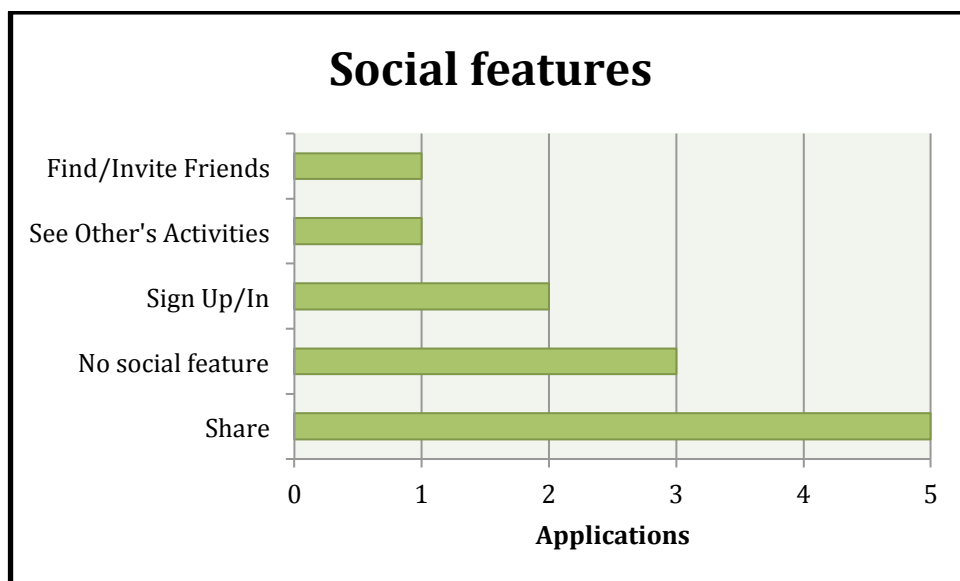


Figure 3.7 Frequency of the social feature types

3.1.3 Task diagrams

To gain better insights in the way users are enabled to perform certain actions in the existing applications, task diagrams have been created for each application. A task is in this context best defined as a way for the user to reach a goal within the application, thus the task diagram shows how the user will reach the end goal of getting informed about a certain product, company or campaign. To create the task diagrams the ConcurTaskTree (CTT) notation has been used (Paternò et al., 1997) in which the tasks can be decomposed into sub-tasks in a tree-like (vertical) structure. Within this notation there is a distinction between four types of tasks, namely abstract tasks, manual tasks, interactive tasks and automatic tasks. For a better visibility, each of these types has received a unique icon:





Task name	Task description	Task symbol
Abstract task	This task is a parent task for multiple sub-tasks, which can be of different types.	
Manual (user) task	This task is performed by the user only.	
Interactive task	This task is performed by the user as he is interacting with the system.	
Automatic task	This task is performed by the system only.	

Figure 3.8 Task type description

Furthermore, time relations between tasks on the same level (horizontal) exist, which allows us to create an order in executing of the tasks. This time relation is being expressed by temporal operators that indicate if the tasks are being performed sequentially or concurrently. The following figure gives an explanation of the used temporal operators in the task diagrams.

Operator name	Operator symbol	Operator description
Enabling	$T1 \gg T2$	This operator creates an order relation. In this case T1 occurs before T2.
Deterministic choice	$T1 \square T2$	This operator creates an exclusive relation. In this case T1 and T2 can be chosen directly.
Concurrency	$T1 \parallel T2$	This operator shows that T1 and T2 can be performed simultaneously.

Figure 3.9 Temporal operators

After creating the task diagrams for the applications, a sequence of tasks, which is in essence the same for each application, has been identified for finding the information piece of which the application is about. This sequence can be seen in figure 3.10, page 35. Every application immediately shows the user all possibilities for finding the needed information piece, except for Buycott, which starts with the UPC scan. From that point on the user is being guided toward the result, but the configuration differs for each application as has been shown in the previous section. The task diagrams for all existing applications can be found in appendix B.

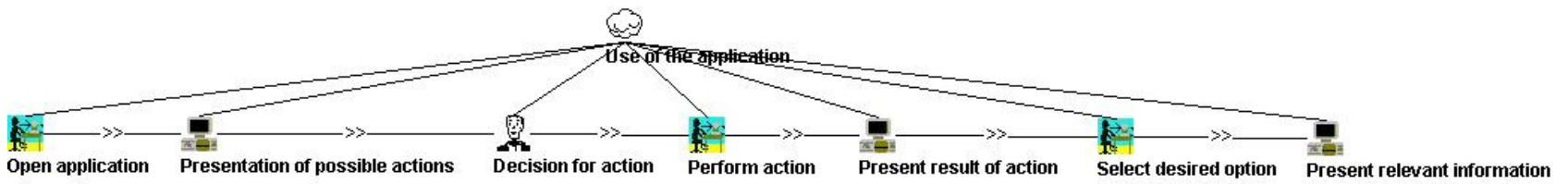


Figure 3.10 Generic task diagram

3.2 Data collection and analysis

The following section describes how data was collected from potential users through a questionnaire and semi-structured interviews. Furthermore, it shows the results from this data collection, which will be used sections following this one.

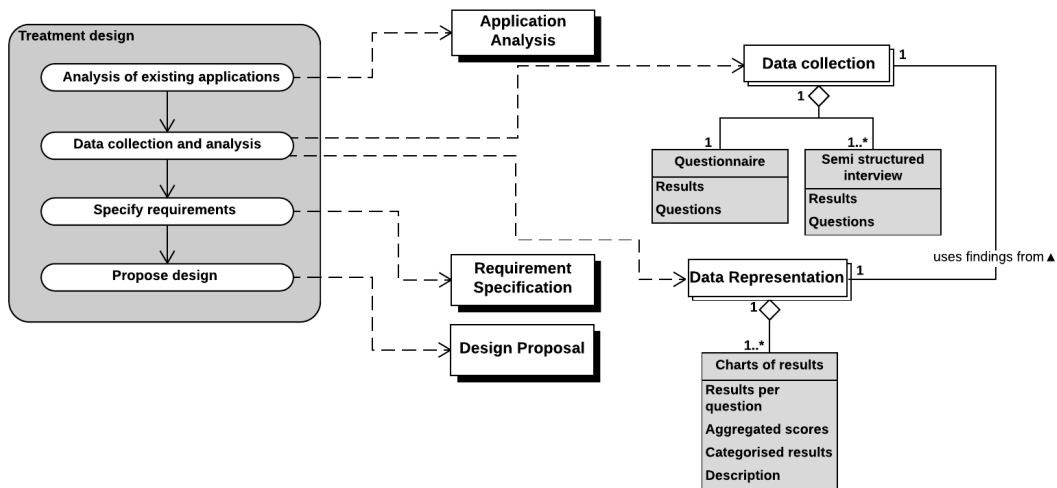


Figure 3.11 PDD for the data collection and analysis

3.2.1 Questionnaire

The main source for input from the population for this research is a questionnaire. This questionnaire has two goals, namely checking if the variables from the ethical decision-making model (figure 2.4) are present and finding out what people’s attitudes, opinions and ideas are about an ethical consumerism application. The respondents were able to answer the questions either by a 5-point Likert scale, choose an answer from a list or write down the desired answer.

The sample for this questionnaire has a size of 66 respondents and consists of people from different age groups, nations, and educational backgrounds. It is a very varied sample, with respondents from the Netherlands, Germany, Australia, New-Zealand, Mexico and the United States but it has been shown that the demographic difference between these groups has no direct effect on the ethical attitudes (de Pelsmacker et al., 2006; Chatzidakis et al., 2007). The questionnaire can be found in appendix C.

The variables from the model for ethical decision-making were distributed over multiple questions that were derived from the earlier research on those topics. Each variable will be discussed with the questions measuring it. Here it has to be noted that the purpose of this research project is not to scientifically validate those variables, this has been done in the research before (see section

2.2). The purpose of this set of questions is to measure if the independently researched variables are, combined, manifested in the train of thought of people who care about consuming ethically. The results for this group of potential consumers will be compared to the results of the potential regular consumers. Thus, the sample has to be divided in two separate groups and this is done by the second question: *How ethical would you describe yourself as a consumer?*. This question separates the respondents into a group that claims they describe themselves as ethical consumers all or most of the time, who will be named *ethical consumers*, and another group that claims to be less or not concerned about ethical issues or does not have the resources to behave that way, who will be named *regular consumers*. Additionally, this question is a measurement for the **self-identity** variable (Shaw et al., 2000), but since this research is not measuring actual intention and behaviour related to the variables, this variable has no further implications.

Question 3 (Q3) measures multiple variables, namely:

- **Knowledge** through the questions *"I inform myself about product(s) before I buy them"* and *"That knowledge affects my decision to buy"*. These questions are derived from De Pelsmacker and Janssens (2007).
- **Subjective norm** through the question *"I care about what people who are important to me think about the product(s) I buy"*. This question is taken from Shaw et al. (2000).
- **Ethical obligation** through the question *"I feel that I have an obligation to buy ethical products"*, which is taken from Shaw et al. (2000).
- **Actual behavioural control** through the questions *"It is easy for me to identify ethical products"* and *"I feel that I am in control of what I want to buy"*. These questions are derived from Carrington et al. (2010).
- **Situational context** through the question *"Sometimes my decision to buy a certain product changes last-minute when I'm in the store"*, which is derived from Carrington et al. (2010).

Question 4 (Q4) measures one variable, the **attitude toward the behavior**, by asking if the respondent believes that him or her consuming ethically will:

- result in more ethical products being sold in general
- encourage companies to sell ethical products
- lessen the amount of non-ethical products on the market
- result in peace of mind

These questions are derived from Shaw et al. (2000) and have been used to measure *behavioural beliefs*, the determinants of the attitude toward the behaviour.

The last question of this section, question 5 and the follow-ups 6&7, are about the neutralisation techniques. Respondents are asked how often their decision changes on the last moment, if that bothers them and if so, how they cope with that. These questions only measure justification as it happens while consuming with the goal to see if neutralisation actually occurs during the decision-making.

Measuring neutralisation that has occurred before shopping is beyond the scope of this research and would have added too many questions to the questionnaire.

The next part of the questionnaire is about receiving input from potential users about what they think about existing tools, such as applications and websites, what their opinion is about an application for ethical consumerism and what they think about features from existing applications. Most of these questions were non-mandatory, open-ended questions. This should ensure that respondents' answers are honest and something they believe is the right answer to the question. The answers to the open-ended questions are being categorized in order to draw possible requirements from them.

The results from the questionnaire can be found in section 3.2.3.

3.2.2 Interview

In addition to the questionnaire, semi structured interviews were held amongst consumers of organic stores. An interview is a qualitative research technique focussing on getting detailed information from potential users by engaging in a dialogue with them. For the purpose of this research this technique is appropriate because it is concerning the users' thoughts and hence, it may yield rich and detailed data.

As is true for any other data collection technique, interviews have certain drawbacks (Boyce and Neale, 2006). Boyce and Neale have identified four drawbacks, which will be discussed next. Also for each drawback its relevance within the scope of this project will be discussed.

1. Prone to bias. This drawback has its base in the thought that participants may want to prove that things they do are correct. Furthermore, they could conform to what they think is right. Fortunately, the goal of this interview is to gain insights in the thoughts, opinions and desires for a behaviour the participants already practice. Because ethical consumerism is different for each individual, there is no right or wrong in the opinions one has on how an application could aid this behaviour. This should result in relatively unbiased responses.
2. Can be time-intensive. Conducting interviews, transcribing them and analysing the results are activities that take quite some time. This will also hold for the interviews that will be held for this research project, but for the purpose of the project it is the best way to truly understand what moves the ethical consumers and hence, what requirements they would have for a potential application.
3. Interviewer must be appropriately trained. This drawback points out that sometimes, the data is less detailed and useful because of the lacking interviewing skills of the interviewer. It is the task of the interviewer to lead the conversation and ensure that it actually is a

conversation in which the interviewee feels comfortable. This problem can be tackled by applying certain interviewing techniques such as avoiding yes/no and leading questions and keeping personal opinions to a minimum.

4. Not generalizable. Due to its time intensiveness, the sample size of in-depth interviews is relatively small and generalizations about the population are difficult to make. This is also true for this research project, but the output from the interviews can still be a good additional input for the requirements specification.

Now, for conducting the interviews a few steps are required. The first one is to plan the interview, which incorporates identifying stakeholders, the needed information and ensuring that the interviewees consent on the data collection. The stakeholders for this research project, as has been described in section 2.4, are people who consume ethically or have interest in doing so. The needed information is the way they use information technology as an aid in consuming ethically, what they would like to improve about or see in it and their opinions about the features of existing applications.

The second step is developing an interview protocol and interview guide. In the interview protocol, instructions that should be followed for each interview are established. These instructions include:

- What to say when starting the interview
- Ensuring consent and confidentiality of the interviewee
- What to do when ending the interview
- What to do during the interview
- What to do after the interview

The interview guide is the list of questions and issues that will be examined during the interview. This guide and the protocol can be seen in appendix D.

After these steps have been accomplished the interviews can be conducted, which resulted in information regarding the gained from three interviewees. However, due to time limitations it has been decided to only ask the questions regarding the potential user's opinion about the application. The results can be found in the next section.

3.2.3 Results from data collection

This section discusses the results from the questionnaire and interviews. Firstly, the results from the questions regarding the ethical decision-making model are being discussed. After that the results regarding the application are being elaborated.

The first set of questions in the questionnaire was focussed on checking if the proposed variables from ethical decision-making model (figure 2.4) are present. As has been stated in section 3.2.1 the sample is divided in two parts, resulting in

a sample size of 27 ethical consumers and 39 regular consumers. Furthermore, to enhance a better visibility of the possible difference between the groups, the Likert scale questions have received an ordinal score. To do this, each response that states a total agreement (i.e. 'I strongly agree', 'Very likely', 'Very often') receives a score of 5. The response next to it (i.e. 'I agree', 'Likely', 'Often') receives a score of 4 and so forth. The actual distribution of responses without the new scores can be found in appendix E. Furthermore, all raw data can be found in Appendix E as well.

Due to the many variables being measured within Q3, the results of the question are split in two parts to ensure a clear overview of the results. The respondents answered this question on a 5-point Likert scale ranging from 'I strongly agree' to 'I strongly disagree'. Now, from the charts in figure 3.12 one can see that knowledge plays a big role in the decision-making in both groups. The next variable, the subjective norm, plays a significantly smaller role in the ethical decision-making. It seems that consumers do not care too much about what others think about the purchasing behaviour.

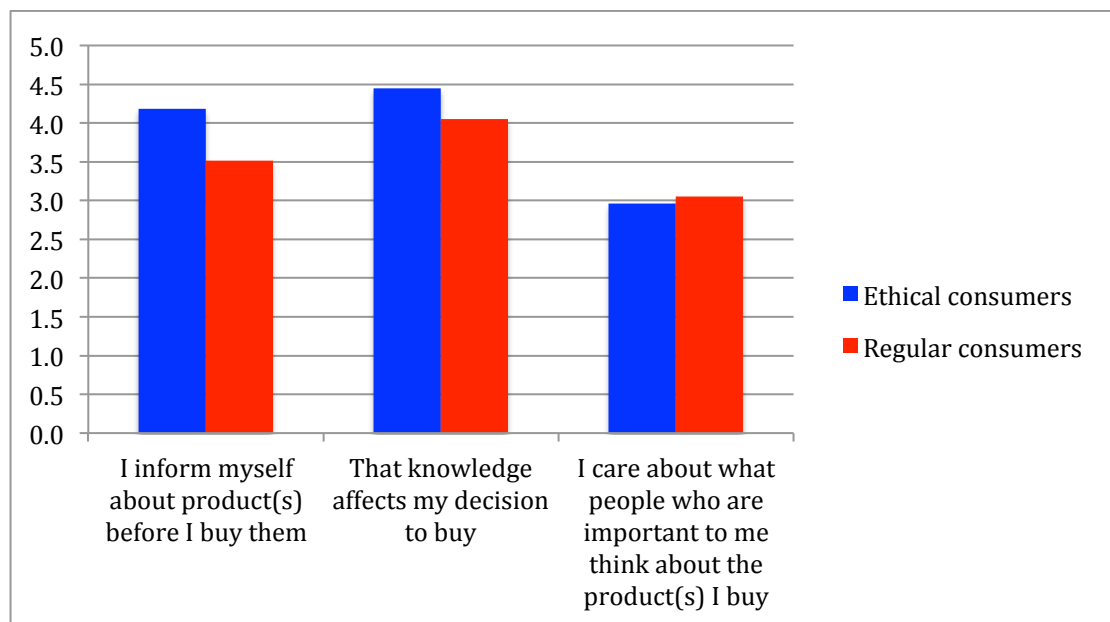


Figure 3.12 Results for the knowledge and subjective norm variables from both groups

The following chart, figure 3.13, shows the results of the other variables from Q3. From those charts it is evident that the ethical obligation plays a large role in the decision-making for ethical consumers, but not so much for the less ethical consumers. Also, the actual behavioural control is more present within the ethical consumers. At last, the situational context is another variable that seems to affect the decision-making significantly within both groups of consumers.

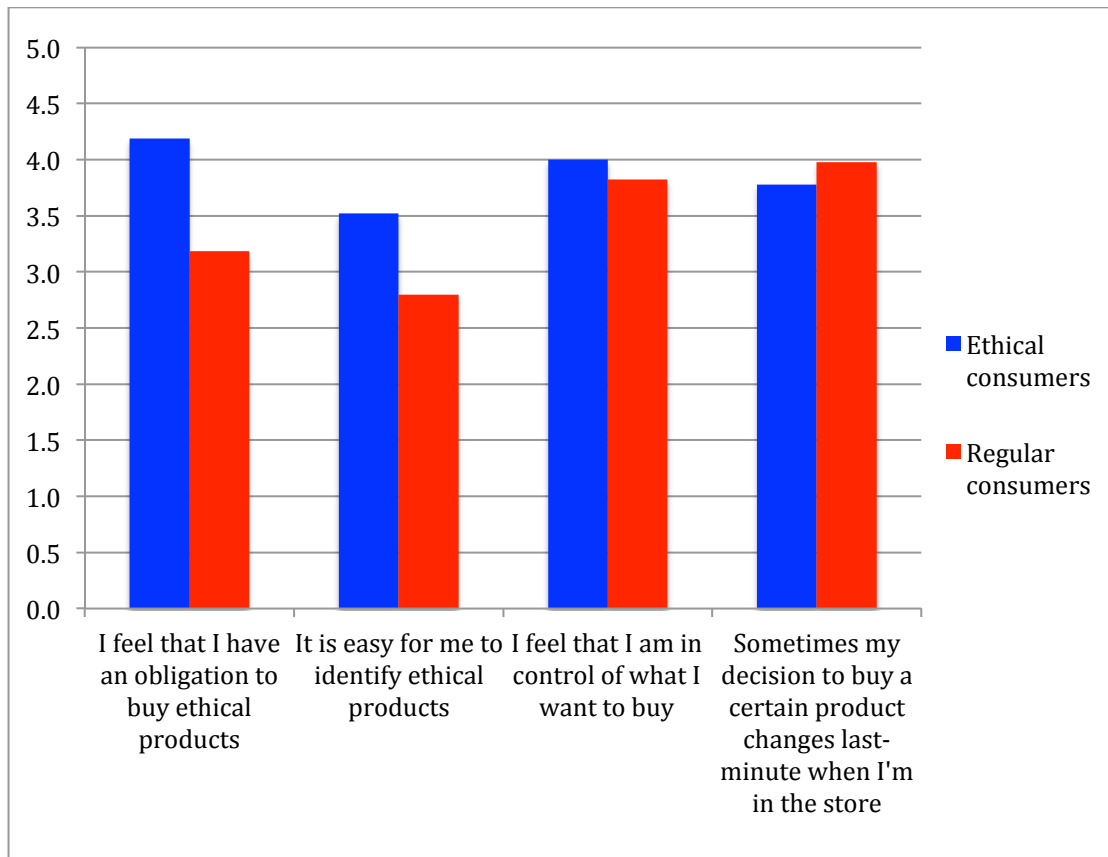


Figure 3.13 Results for the ethical obligation, ABC and situational context variables from both groups

The next question measures the attitude toward the behaviour. The respondents answered this question on a 5-point Likert scale ranging from 'Very likely' to 'Very unlikely'. Figure 3.14 shows that for both groups the behavioural beliefs about ethical behaviour are quite positive. This means that the attitude toward the behaviour is another variable that is present significantly within the decision-making of consumers.

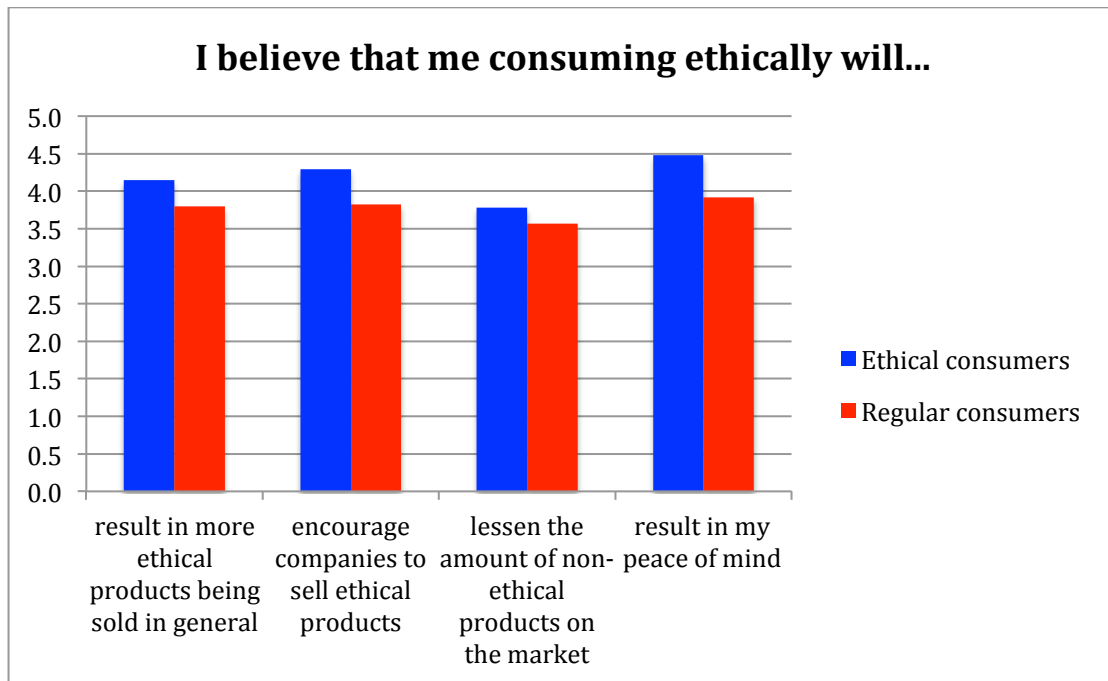


Figure 3.14 Results for the attitude toward the behaviour variable from both groups

The final question about the ethical decision-making is about the neutralisation techniques. The respondents answered the first question on a 5-point Likert scale ranging from 'Very often' to 'Never'. The follow-up questions could be answered by a yes/no/sometimes statement and a open ended response. From the results to these questions it can be concluded that it happens to every respondent that the choice of buying a certain product changes due to certain factors at some point. Only the frequency of this differs per person. Furthermore, it seems that the ethical consumer group is more bothered by this change of decision but this still does not bother a large share of the respondents at all. Finally, the last question gave the opportunity to state a reason for changing the decision. 12% of the respondents answered this question and unanimously stated a reason that could be categorised as the denial of responsibility technique.

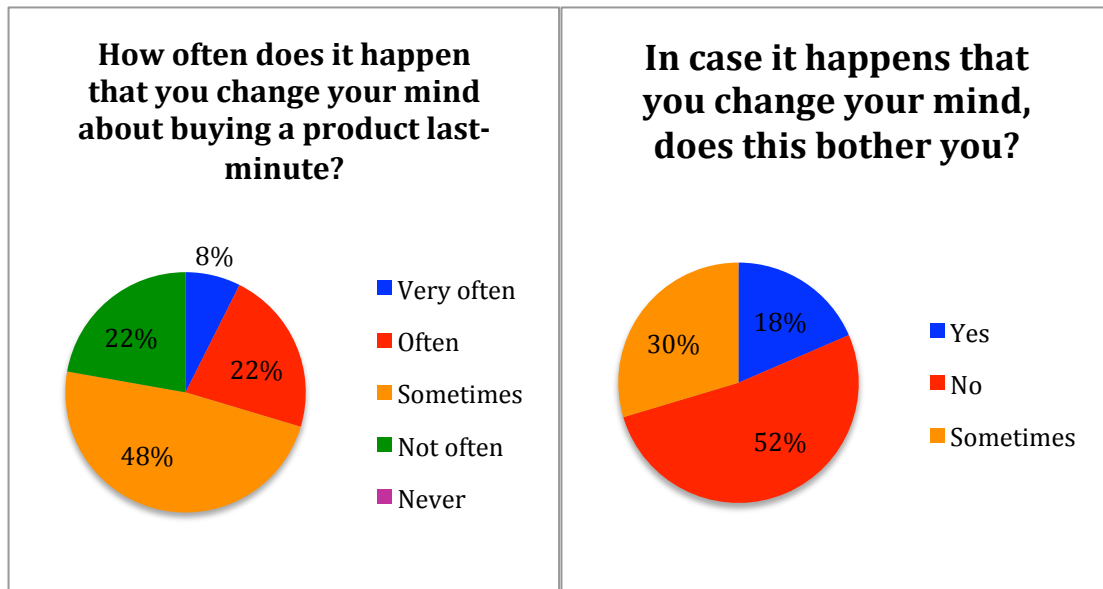


Figure 3.15 Results for the neutralisation variable for ethical consumers

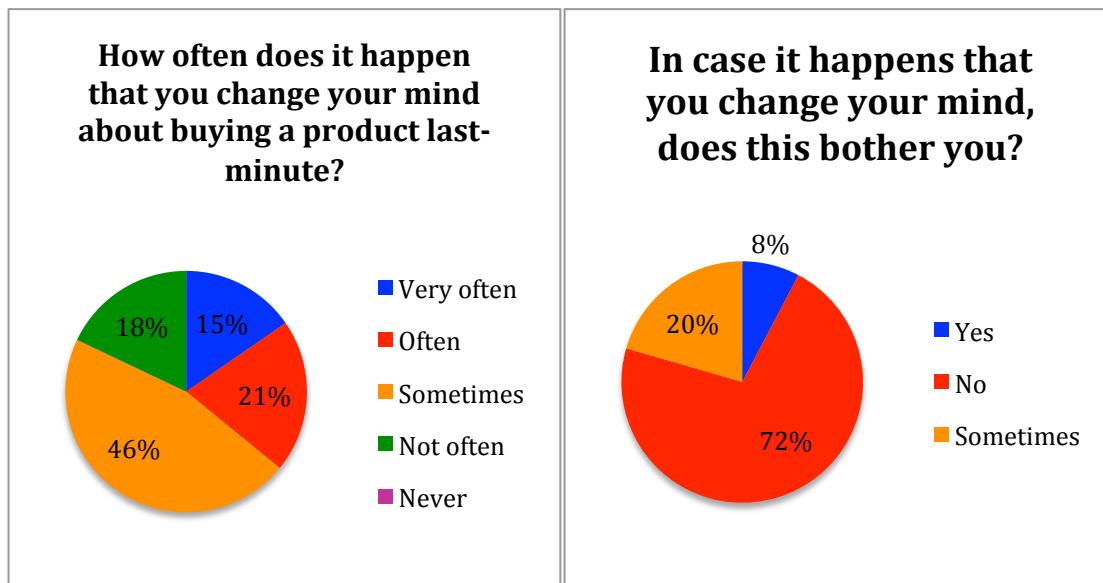


Figure 3.16 Results for the neutralisation variable for regular consumers

The next section of the questionnaire was about the respondents' opinions about the application. Each question received a varying amount of responses, which will be given during each elaboration.

Question 6 asked the respondents if they use any tool (e.g. an app, website, product reviews etc.) as help in their decision-making. In case the respondent does use a tool he or she had the possibility to tell what he or she liked about the tool and what could be improved. 43 respondents answered this question and more than half of these respondents do not use a tool as an aid in the decision-making as can be seen in the following figure. This number is almost equal between the two groups of respondents. Unfortunately, it is not clear which tools the respondents use in case they do use a tool.

Like most of the respondents, two of the interviewees also do not use a tool. They relied on the assumption that the organic supermarket provides only products that are in line with their interests. The other interviewee said to search the products on Google if more information was required.

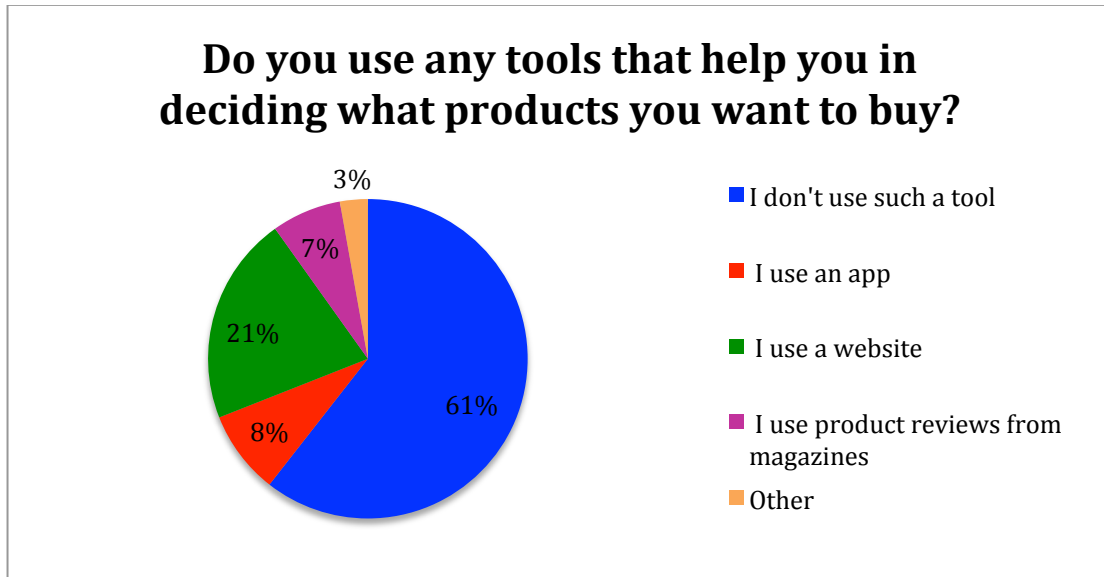


Figure 3.17 Usage of tools for decision-making

The next figure shows the categorized responses to the first follow-up question from the 28 respondents who said to use a tool. Since the question is open ended, each response was evaluated independently and placed within one or multiple categories depending on the content of the response. The resulting chart shows that, as has been stated in chapter 2, the right information is a key asset.

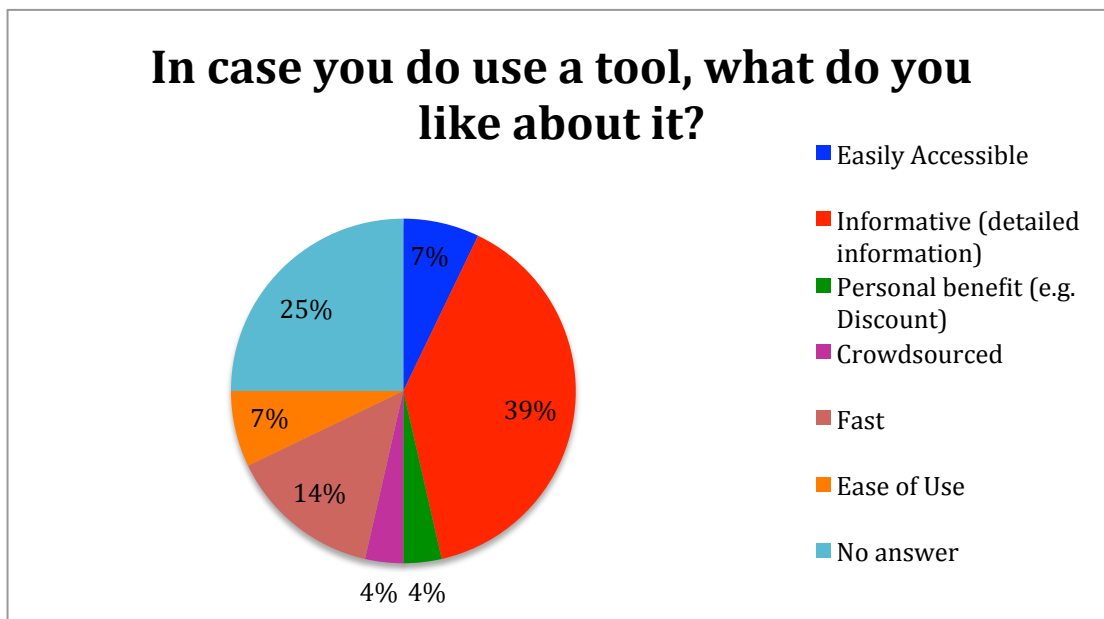


Figure 3.18 Positive aspects of existing tools

The suggested improvements, as can be seen in figure 3.18, are almost completely focussed on the data representation towards the user and the way of finding products. Here again, each of the responses from the 28 respondents was evaluated independently and placed within a category. The interviewee who googles certain products from time to time commented that google's database is very large but it requires quite some time to find the right piece of information.

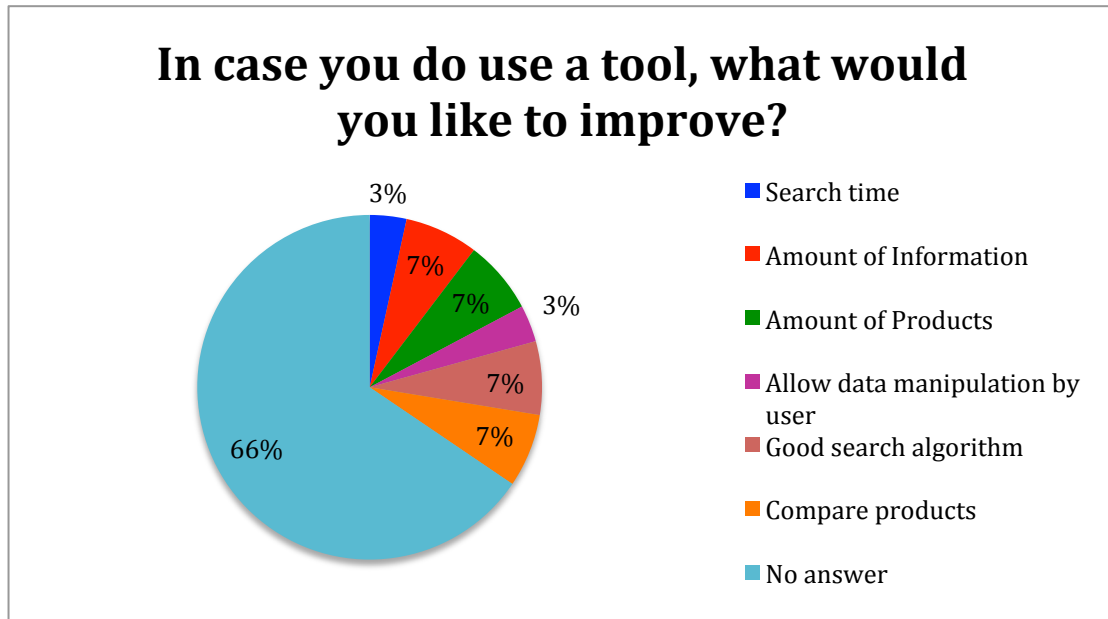


Figure 3.19 Suggested improvements for tools

Question 7 focuses on the opinions of potential users of the application. It looks at what people think of an application for ethical decision-making and what kind of information it should display. 48 respondents answered this open-ended question but unfortunately there is no way of telling if a blank answer means that respondents did not like the idea of the application or simply ignored the question, thus the total amount of respondents was used for this question. The first question asked the respondents about their opinion on such an application. As the following figure shows, the majority of the respondents have a very positive attitude towards the application, which is also manifested in a high rate of respondents saying they would use such an application (figure 3.21).

All interviewees agreed that such an application could be useful, especially if the user has not much knowledge about these matters. One of the interviewees who did not use a tool replied that she would use it to check how the products she buys would score. The interviewee who uses google replied that such an app, in the case that the database is extensive, would make his life in that aspect easier.

What do you think of an app that provides you with information about the ethical issues concerning the product you want to buy?

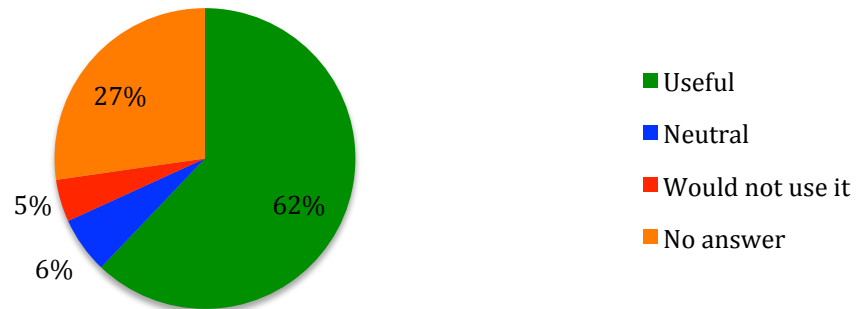


Figure 3.20 Respondents' opinion about the application

Would you use such an app?

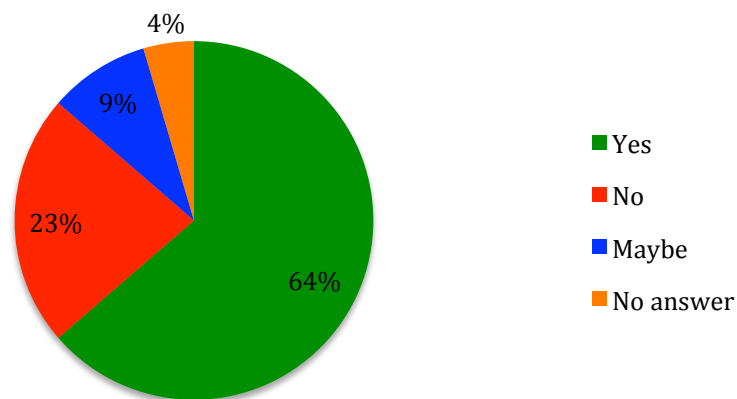


Figure 3.21 Respondents' willingness to use the application

The next question asked what kind of information the application should display. 50 respondents answered this question and the responses to this open question were categorized. The frequency of the categories mentioned by the respondents is shown in figure 3.22. Most of these categories contained specific examples of what kinds of variables people would like to see. Thus, for the ethical impact, detailed product information and production process the frequencies of specific examples are shown as well.

Now, in the following figure we can see that information considering how the product is produced, what it is and its ethical effects are very important to the respondents. The other two categories have been named less frequently but the fact that they have been mentioned by this relatively small sample means that they should be considered as requirements as well.

Additionally, from the interviews it became clear that transparency of the information and its sources is important. The users want to know where exactly the information comes from and do not want to be forced to believe something that is being said in an application. Thus, a form of additional information discussion about the product should be allowed.

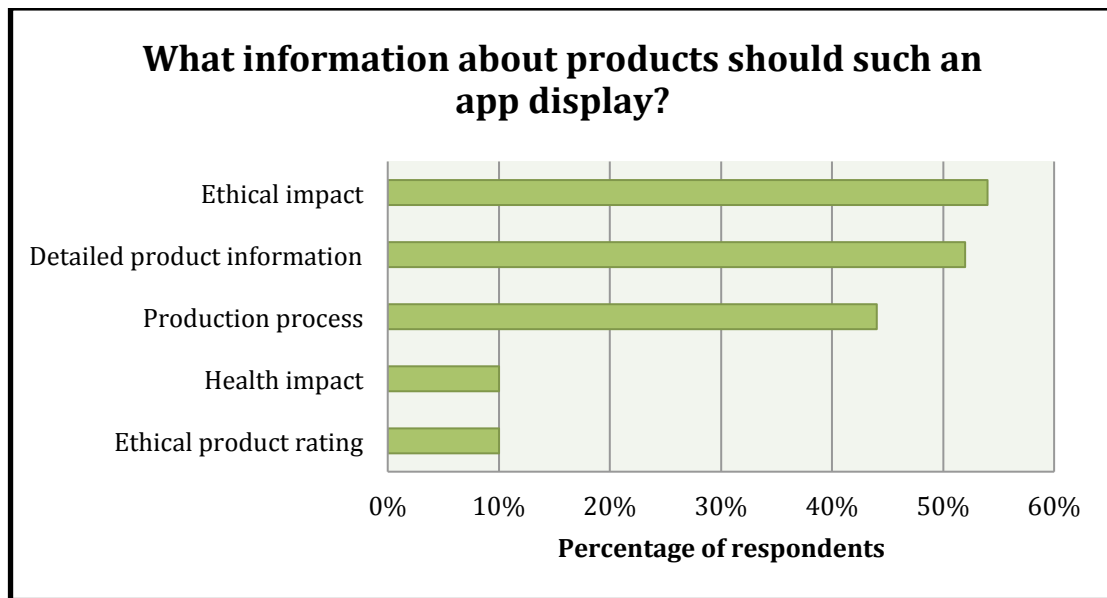


Figure 3.22 Information categories

The next figure shows the examples for the 'Production process' category. It shows the frequency with which specific categorised examples were mentioned. Within the context of this research project the corporate social responsibility (CSR) is defined as "actions of firms that contribute to social welfare, beyond what is required for profit maximization" (McWilliams, 2015). From this figure it can be concluded that a detailed description of the way the product is produced, with these factors in mind, is necessary.

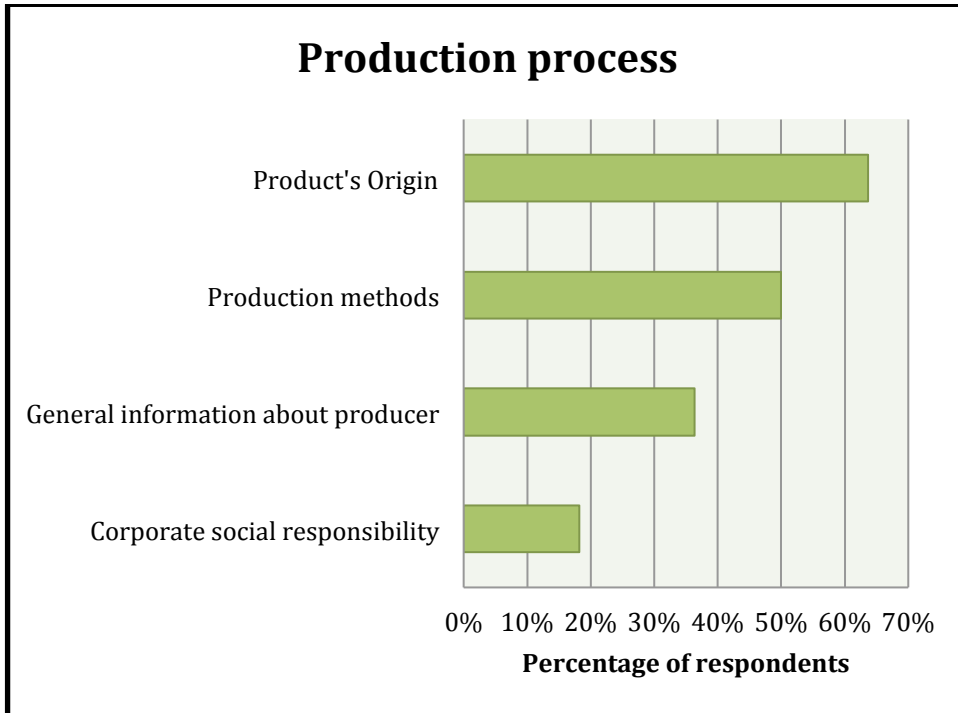


Figure 3.23 Specific production process examples

The ethical impact category consists of some high-level and some specific examples (figure 3.24). The reason for this is that some respondents were more specific in answering the question than others. Even though some specific examples, such as CO₂ emission or fair trade, could have been part of other high-level examples (i.e. environmental impact and human welfare issues) it has been decided that, for the goal of this project, showing clear and specific examples from respondents are in line with the goal of finding the right requirements.

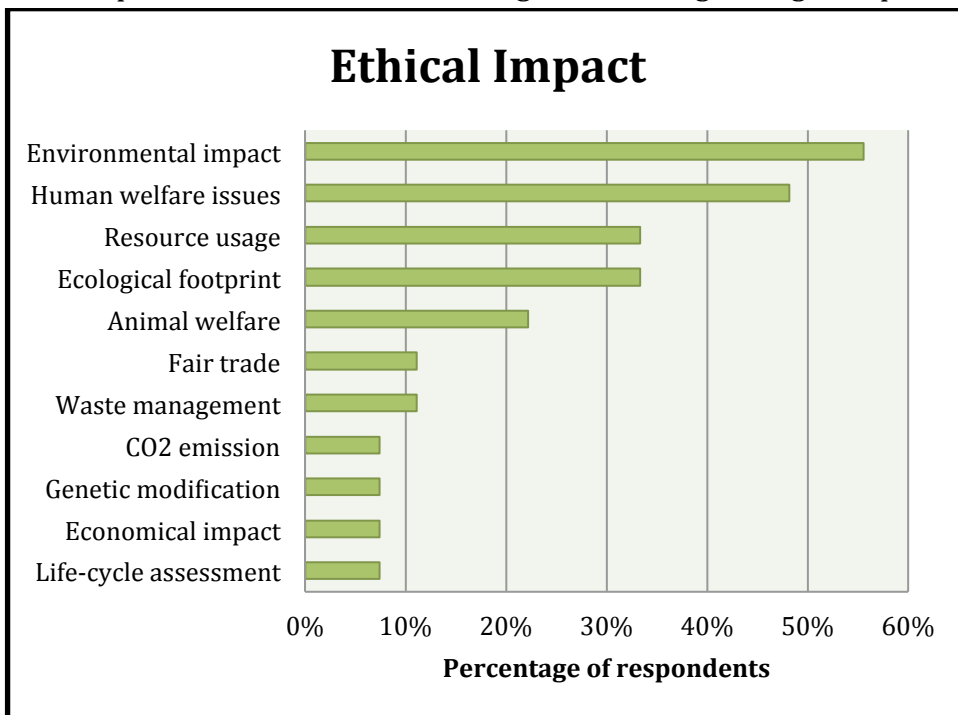


Figure 3.24 Examples for the ethical impact category

The next figure shows the kind of information pieces the respondents named for using in the product description. General information, like the ingredients, nutritional value and price are considered as important. Additionally, any certifications and standards for which the product qualifies should be displayed. The less frequently stated examples are also worth considering since they will give a more complete view on the product. Finally, one entry is an interesting one to consider, namely the crowdsourcing. This has been named before in question 6 (figure 3.18) and means giving the users the possibility to add and discuss content, which could result in an even richer experience.

From the interviews, the following information pieces were identified: local product (origin), transportation, resources used, where to buy the product, healthiness, Fair Trade, product details (i.e. ingredients, nutritional value, healthiness and allergy), animal treatment and if the product is suited for a certain diet (e.g. vegetarian, vegan, gluten-free etc.).

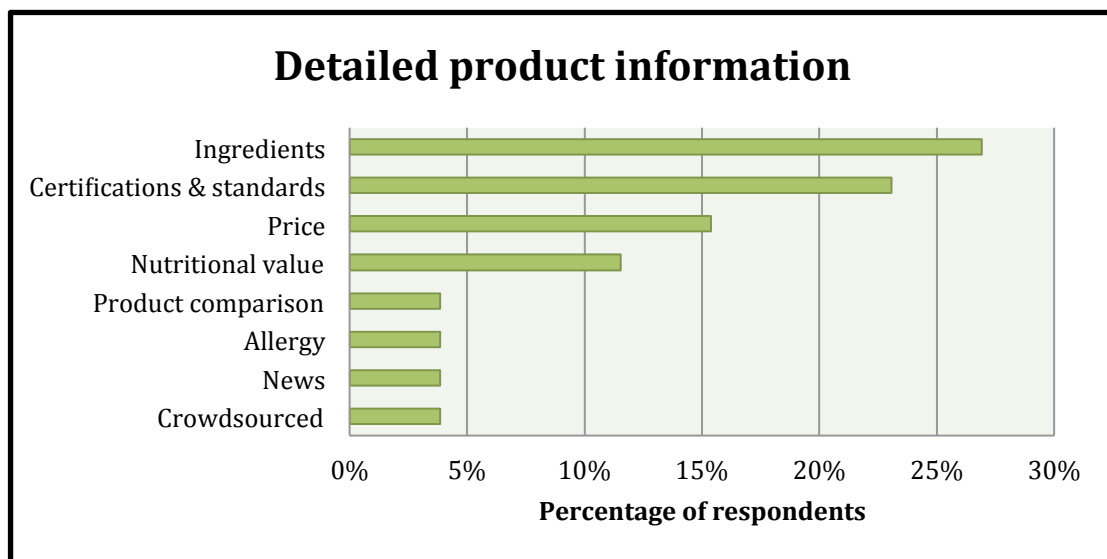


Figure 3.25 Examples for the product information category

Now that we have an indication of what information about the product could be displayed we will look at what content could be added additionally. To achieve this the respondents were asked to select from a variety of options the ones they would like to see in the application or add something themselves. 57 respondents answered this question and the results can be seen in figure 3.26. Since respondents could select multiple answers, the total amount of percentages exceeds the 100%.

The figure shows that additional information is greatly appreciated, especially when it comes to things one can do to incorporate ethical consuming into his or her lifestyle. Additionally, three respondents added options themselves, which are product reviews, where to buy local products and showing how the rating is established.

Two of the three interviewees stated that they liked the idea of additional information in the application. Especially the recipes were thought of as a good idea since, according to one of the interviewees, many people do not know how to translate the knowledge about products into a lifestyle. Additionally, the idea of informing the user about sustainable living (including green energy), such as solar power or composting, was liked as well.

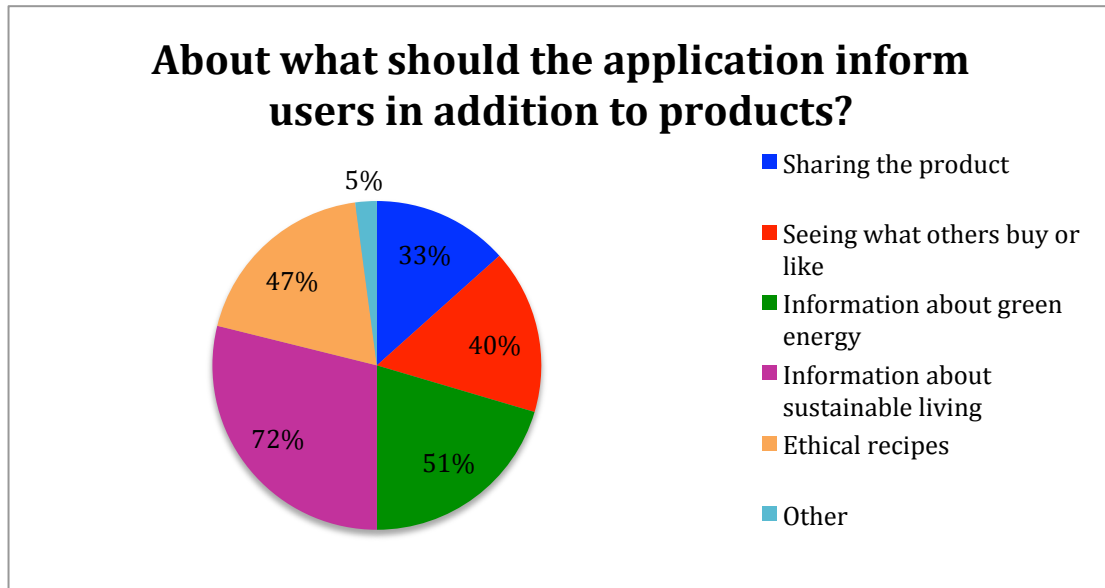


Figure 3.26 Additional information

The final two figures are about the respondents' opinions on some features that already exist in the applications discussed in section 3.1. The features, which also include attributes, were either selected on the frequency within the existing applications or by the researcher because he found that a more elaborated opinion from the sample was required. These questions received many responses, 91% of the respondents answered almost all of the questions. From the two following figures it can be concluded that popular products and a home page are not considered to be very important. However the other features, which were rated as 'important' or 'very important' by more than half of the respondents, are features that are important to the potential users and therefore should be considered as requirements for the application.

The responses from the interviewees were in line with the findings from the questionnaire. All of the interviewees found the following features important: being able to see what the alternatives are and where to buy them, information about the producer of the product, information about the people behind the application and adjusting the importance of the ethical issues in the rating. One of the interviewees liked the idea the social features and another liked the idea of the popular products but not the categories. All the interviewees did not like the idea of the 'home screen'. One of them commented that it just would be too much; she just wants to find a product quickly if she would use the application.

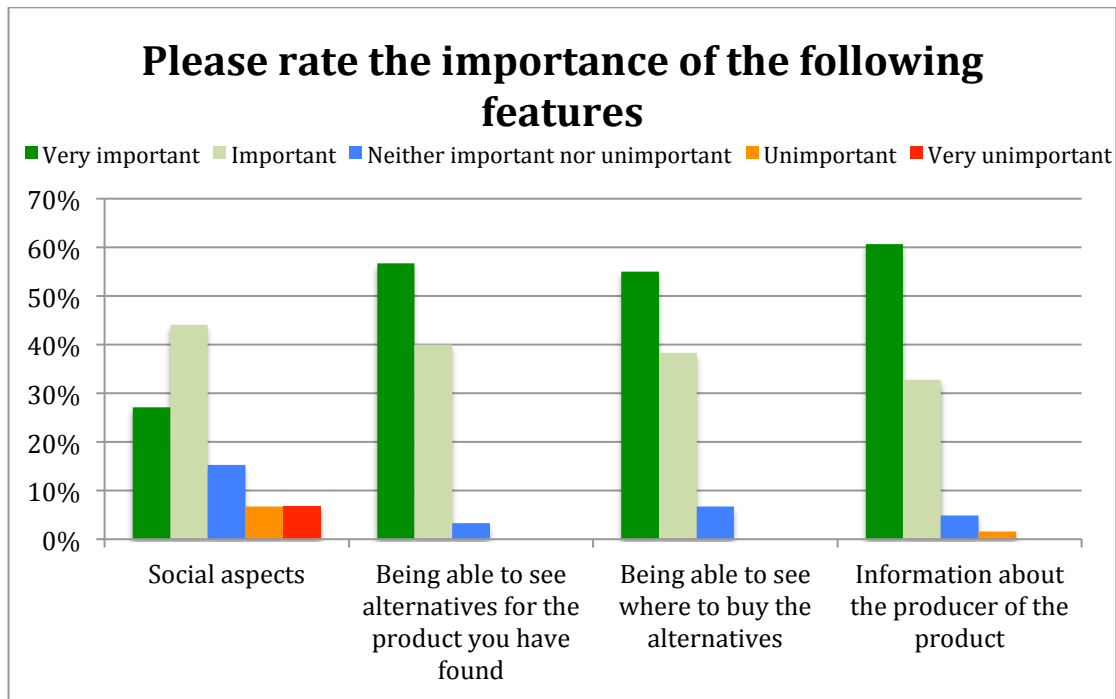


Figure 3.27 Importance of features [1]

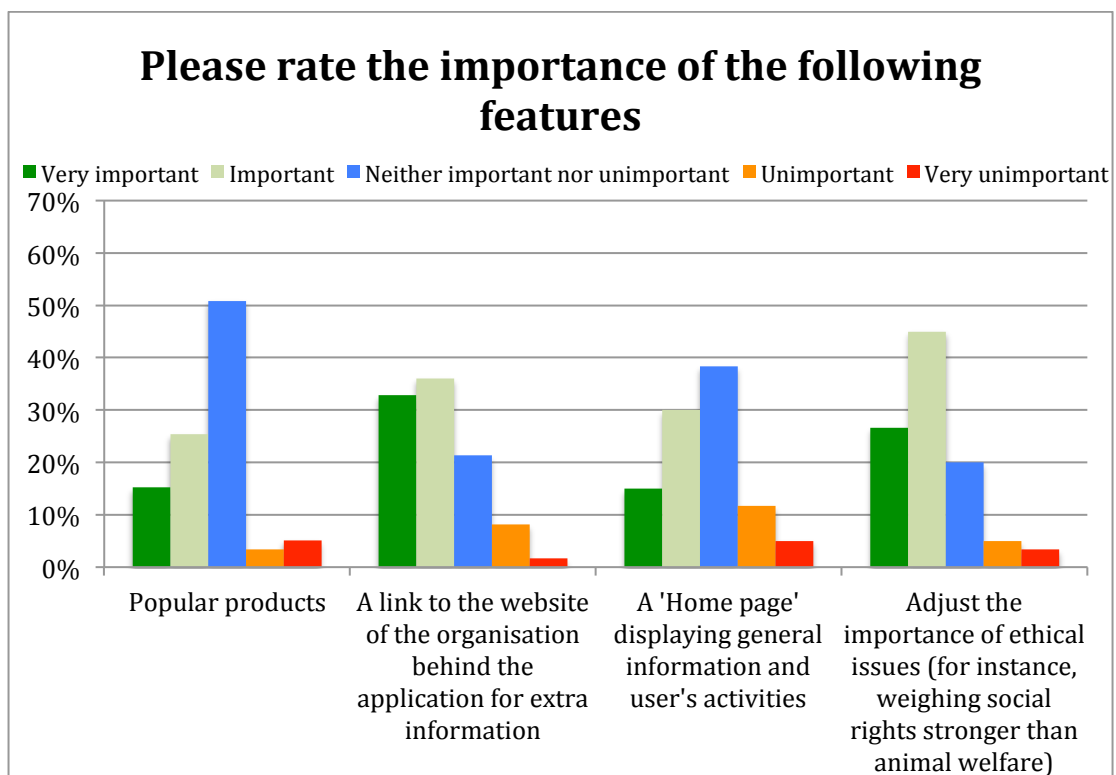


Figure 3.28 Importance of features [2]

3.3 Requirements specification

Now that the research has been completed and the data is known, the goal of this research project can be documented. Therefore, in this section we will elaborate on the requirements for an application that aids its user in making

informed decisions about the ethical implications of the product(s) he/she intends to buy.

Firstly, it has to be clear what a requirement is. Wieringa (2014) describes a requirement as “a property of the treatment desired by some stakeholder, who has committed resources (time and/or money) to realize the property.” Within the context of this project, the treatment is the application itself and the stakeholders are the users, and thus stakeholders, described in section 2.4.

The requirements for this application will be separated into two groups, namely functional and non-functional requirements. Functional requirements specify what a system is supposed to do. Non-functional requirements specify the qualities a system should have. Furthermore, each group of requirements is divided into sub-groups to ensure that all requirements of a certain aspect of the application are grouped together. Subsequently, each requirement receives an identifier, a description and, if necessary, a rationale, which will be placed under the description in the same row.

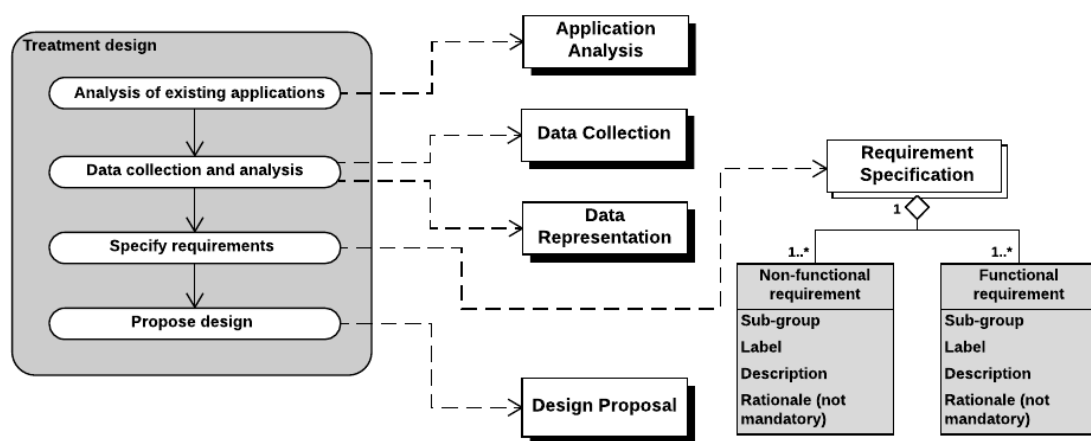


Figure 3.29 PDD for the requirement specification

3.3.1 Non-functional requirements

Most non-functional requirements can be applied to many applications and range from design principals over usability, performance, environmental, operational, supportive and security requirements to cultural, political and legal requirements (Preece et al., 2015). This is a large group of requirements and it is beyond the scope of this project to list all these requirements. This does not mean that these requirements are not important, it is only unnecessary in this stage of the design phase to state requirements about matters like allowed downtime, fault tolerance, touchscreen functionalities, database size, efficiency of queries, amount of updates, legal issues etc. Instead, only the non-functional requirements that we find essential and which are applicable in the field of ethical consumerism applications will be listed here.

Look and feel

Table 2 Non-functional look and feel requirements

Identifier	Description
NFR1	The design of the application must be aesthetically pleasing.
	The application should look good and give the user the feeling that he/she is using a modern application that is designed with care.
NFR2	The design must be constant throughout the different screens.
	To prevent confusion and ensure cohesion within the application, the same design principals (e.g. use of colours, place of icons and widgets) have to be applied on all screens.
NFR3	The colour of the rating number has to be adjusted to its score.
	Ratings of 8.5 and higher receive a dark green. 7.5 and 8 light green. 6.5 and 7 yellow. 5.5 and 5 orange. Any score lower than 5 must be red.

Usability

Table 3 Non-functional usability requirements

Identifier	Description
NFR4	The font size must be adjustable.
	In the case that users have a limited visibility it has to be possible to adjust the font size to a larger and smaller size.
NFR5	The design must be colour-blind friendly.
	To ensure that the application is usable for most users the design has to avoid same-contrast colour combinations and buttons in the same colour range as the background must have a contrasting border.
NFR6	The application must give feedback to the user during usage.
	At any point during the interaction with the system the user has to know when the system is doing something or something went wrong.
NFR7	During the interaction the system must provide the user with a sense of direction.
	Each time the users moves to a deeper level in the application the transition between screens has to move from the right to left en vice versa when the user is moving back to the previous level.
NFR8	Each button, icon and widget must have a familiar design and good affordance.
	Users should be able to immediately recognize where each button, icon or widget lead to. Therefore, the used wordings have to be unambiguous and the metaphors have to be understandable for the user.
NFR9	Users must have the ability to create a personal account.
	Creating an account can be done by creating a new unique username/password combination or using an existing social media account. This requirement is based on the finding that users should be able to contribute content to information pages.

Identifier	Description
NFR10	Users should be able to login with their account. Being logged in with an account unlocks certain functions, such as uploading articles and videos.
NFR11	Users must be able to change the password.
NFR12	Users must be able to adjust the rating algorithm in a detailed way and extremely detailed way. See NFR13 and NFR14 for more details. This requirement as well as NFR13 and NFR14 are based on the fact that there will be users with a varying interest and knowledge as has been described in section 2.4. Additionally figures 3.19 and 3.28 show that potential users are interested in this feature as well and figure 3.3 shows that this has been applied in an application before.
NFR13	The detailed way of adjusting the rating must enable the user to adjust the importance of the environmental impact, human welfare and animal welfare issues in three categories, namely 'low', 'regular' and 'high'.
NFR14	The extremely detailed way of adjusting the rating must enable the user to select for each ethical issue which ethical components will be included in the calculation of the rating. For example: users that are considered about the CO2 footprint and waste management of a product but not its water usage and the use of pesticides may select this.
NFR15	The product ratings have to be constructed through scores for each of the three main ethical issues, namely environmental impact, human welfare and animal welfare.
NFR16	The score for each ethical issue (e.g. environmental, human welfare and animal welfare) must be constructed by scores given to the measurable components of which the issue consists of. For instance, the human welfare score will be calculated through scores given to components, such as child labour, a fair salary and the right to form unions.
NFR17	The rating must only consist of whole and half numbers (e.g. 7, 7.5, 8)
NFR18	Users must be able to reach the desired information page in different ways. To ensure that the user can find the information he/she is looking for, multiple ways of reaching that piece of information must be in place.

3.3.2 Functional requirements

For the functional requirements, which specify what the system must do, the same limitation as for the non-functional requirements applies. This means that only the requirements that are considered important within the context of this project are being shown.

These requirements are based on the findings derived from the feature analysis, questionnaire and interviews in the previous sections.

Main menu

Table 4 Functional requirements for the main menu

Identifier	Description
FR1	The application has to show the user a search field to start a database search.
	This requirement is based on the finding that every examined application uses this feature (figure 3.3) and it ensures that information is findable in different ways as has been stated in NFR18
FR2	The application has to show the user a familiar widget to commence browsing the catalogue of products.
	This requirement is based on the finding that seven out of the eight examined applications use this feature and it ensures that information is findable in different ways as has been stated in NFR18
FR3	The application has to show the user a familiar widget that launches the UPC scan.
FR4	The application has to show the user a familiar widget for finding additional content.
	This requirement is based on the users' desire for additional content (figure 3.26).
FR5	Additional data has to be displayed in the main menu.
	By scrolling through the main menu, the user can find additional information, namely recipes (random and popular), highlighted products and brands, sustainable living tips and, in case of a login, products that friends have contributed to. This is in line with the finding that potential users want to see additional content (figure 3.26).

UPC scan

Table 5 Functional requirements for the UPC scan

Identifier	Description
FR6	Users must be able to scan a product by its universal product code.
	By scanning the code the user is able to find information about the product in hand in a fast way. Needed technologies such as a camera and an application for scanning barcodes are readily available for smartphones. This requirement is based on the finding that it has been applied in some existing applications (figure 3.3), that potential users state that a fast and easily usable application is something they like (figure 3.18) and it ensures that information is findable in different ways as has been stated in NFR18
FR7	Within the scanning environment there has to be a field for typing in a UPC manually.
	As an alternative to scanning the UPC, users should be allowed to type in the product number manually in case the scan does not work. This requirement is based on the finding that not every application with the UPC scan supports this function (figure 3.4) and it has been concluded

Identifier	Description
	that this function will ensure another way of making the application fast and easy to use.
FR8	Within the scanning environment the user can always cancel the scan. In case that the user decides not to scan the product and wants to return to the main menu he/she should be able to cancel the scan in an easy and understandable way.

Database search & browsing

Table 6 Functional requirements for the database search and browsing

Identifier	Description
FR9	The system has to return results containing the exact string specified in the search query. In order for users to find the exact product, a certain product category, brand, recipe or a recipe containing the product the system has to return all results that have the query in their title or description.
FR10	Results for the database search have to be ordered according to the category the result belongs to, namely products, brands, ethical recipes and sustainable living. For more information see FR14. This requirement is based on the finding that a filter has been applied in many existing applications and half of those filters allow the user to filter on categories (figures 3.3 and 3.5).
FR11	Results for the database search must be automatically sorted to the best match of the query and received rating (high to low). This requirement is based on the finding that many existing applications allow the user to sort the result of the search. Two of the mainly used attributes of those sorting algorithms include sorting relevance and rating (figures 3.3 and 3.6).
FR12	The user must be able to apply a filter to the database search and browsing. In order for the user to find the right piece of information he/she can choose to filter the results on stores and health indication. This requirement is, just like FR13, based on the implications from figures 3.3 and 3.5.
FR13	The user has to be able to browse through all four categories and their corresponding sub-categories. For more information see FR14
FR14	The catalogue of information pages must be divided into four distinct categories, namely products, brands, ethical recipes and sustainable living. Users want to be able to inform themselves about more than just the products. This is the reason that ethical information about brands is included as well as ethical recipes and information & tips about sustainable living. This requirement is based on the finding that potential users want to know more than only product related information (figures 3.3, 3.22, 3.26 and 3.27).

Identifier	Description
FR15	<p>The four categories stated in FR14 must be divided into subcategories and sub-subcategories if needed.</p> <p>To ensure a better overview of the search results and to enhance the browsing experience, certain categories will be divided into subcategories. For instance, 'products' can be divided into food, cosmetics, electronics and 'ethical recipes' into vegetarian, vegan, no salt etc. Furthermore, subcategories can be divided again into subcategories, for instance 'food' can be divided into bakery, dairy, meat etc.</p>
FR16	The four main categories stated in FR14 must be ordered in four columns that are placed next to each other and can be switched to by swiping left or right.

Additional content

Table 7 Functional requirements for the additional content

Identifier	Description
FR17	<p>The additional content menu has to include the following items:</p> <ul style="list-style-type: none"> - Explanation of ratings and data sources - Login/logout - Settings - Tips for ethical consuming - Information about the app - Information about the developer - My saves - Personalize ratings - Contact & feedback - FAQ <p>Through these items the user can find out more about the context in which the application operates and personalize the application. Also it is possible to read legal statements and the believes of the creators of the application. This requirement is based on the finding that potential users want to be able to find out more about the context of the application (figures 3.18, 3.26 and 3.28)</p>
FR18	The 'explanation of rating and data sources' page must display information about how the ratings are being calculated and which data sources are being used with links to additional information about those sources.
FR19	The 'settings' page must contain functions that the user can click/touch to change password, e-mail address, language and font size.
FR20	The 'tips for ethical consuming' page must display information about general tips for consuming ethically.
FR21	The 'information about the app' page must display who the creators are with link to social media, information about the development, the rationale behind the application, a transparency and privacy statement and the terms & conditions.
FR22	In the 'my saves' page the user must be able to find all latest saved

Identifier	Description
	information pages.
FR23	In the 'personalize ratings' page the user must be able to adjust the rating algorithm to personal preferences. See NFR12, NFR13 and NFR14 for more details.
FR24	The 'contact & feedback' must display an e-mail address, physical (post) address and form for providing feedback.
FR25	The 'FAQ' must display the most frequent asked questions and answers about any issue related to the application.

Information pages

Table 8 Functional requirements for the information pages

Identifier	Description
FR26	The application has to enable users to save 10 favourite information pages, such as product information or a recipe, to be accessible without an internet connection. Not all users can or want to be connected to the internet at all times. This requirement enables these users to still use previous researched information during activities like grocery shopping.
FR27	Each product, brand, ethical recipe and sustainable living entry within the database must have its own information page. This requirement is based on the finding that every existing application supports this function (figure 3.3).
FR28	The page containing the relevant information for a product has to be divided in tabs with quick information, ethical impact, production process, detailed information and news & discussion. By dividing the information page into different sections the user will have a better overview on the available information without perceiving an overload and it allows users to find out about product as much as they want. This requirement is based on the difference of engagement of the stakeholders described in section 2.4.
FR29	The 'quick information' tab has to display the following: image, rating, health indication, availability, alternatives and option to save and/or share the product. This requirement is based on the finding about the product information as can be seen in the figures 3.25 and 3.27.
FR30	The 'ethical impact' tab has to display information about the following: environmental impact, human/social welfare issues and animal welfare issues. This requirement is in line with the findings from figure 3.24.
FR31	The 'production process' tab has to display the following: general information about the producer or link to the information page of the producer, place of origin of the product and a description of the production process. This requirement is in line with the findings from figure 3.23.
FR32	The 'detailed information' tab has to display the following: Ingredients, nutritional value, allergy information, diet recommendation, certifications and standards. This requirement has its base in the findings from figure

Identifier	Description
	3.25.
FR33	The 'news & discussion' tab has to display the following: any relevant scientific and news articles or videos, a button to add new articles or video and a section for comments and discussion for users. This requirement is based on the mentions of crowdsourcing from figure 3.18 and the function of certain existing applications that allow the user to add content to the information page.
FR34	The page containing the relevant information for a producer has to display the following: company logo, general description of the producer with link to website (if available), ethical considerations (or the absence of these if no information is available), any relevant scientific and news articles, corporate social responsibility, certifications and standards as well as the option to save and share the company. This requirement is based on the findings from figure 3.23 and 3.25.
FR35	The page containing an ethical recipe must display the following: picture, ingredients, main nutritional values, amount of portions, where ingredients can be bought, how to prepare the meal and, if available, a video of the preparation of the meal.
FR36	The page containing information about sustainable living must display general information about the topic in question, any relevant news and scientific articles, ethical issue(s) it relates to and useful links for further investigation.
FR37	Each information page must have a 'news & discussion' tab.

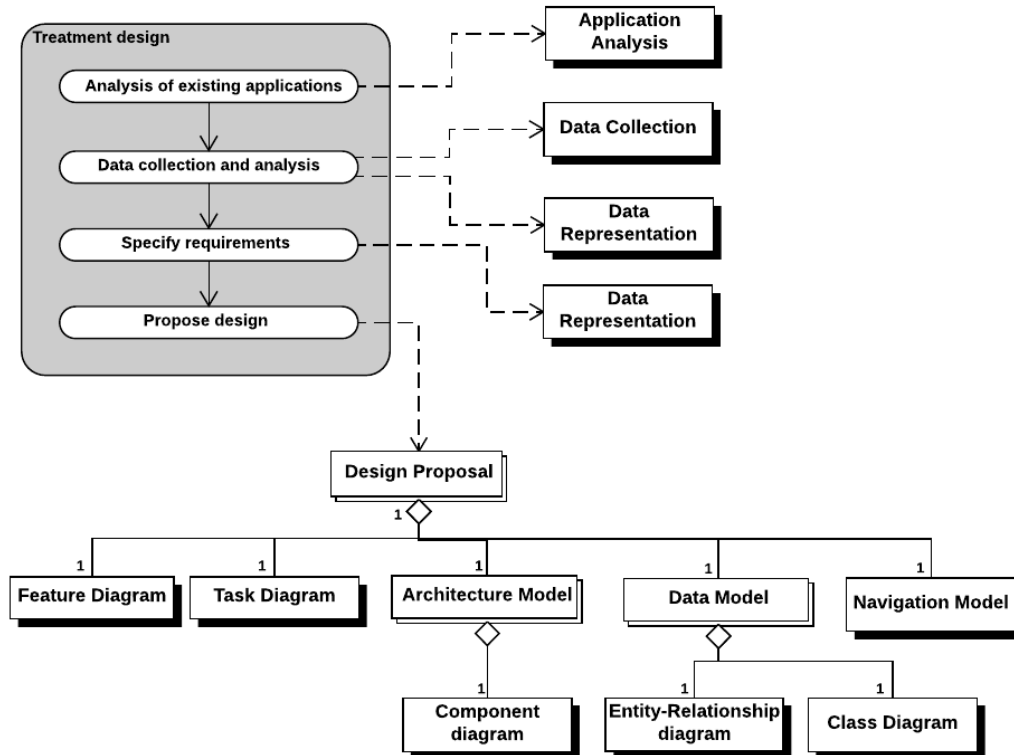
Other functions

Table 9 Functional requirements for the other functions

Identifier	Description
FR38	The first time a user opens the application an automated introduction will show the user most available functions step by step. For novice users that do not want to explore the application by themselves the guide shows the functionalities of the application in an understandable way including pictures.
FR39	The user must be able to skip the automated introduction at any time.

3.4 Design proposal

This section will give a brief introduction to a design proposal. Since it is beyond the scope of this project to build a functional prototype only a feature diagram, task diagram, data model, architecture model and navigational model of selected wireframes of the application will be created. These diagrams and wireframes will be based on the research from the previous chapters and will give a good overview of the basic configuration of the application and may be a starting point for the design of a working prototype.



3.4.1 Feature Diagram

Firstly a Feature Diagram has been created. The first thing to notice here is that the diagram is larger than the other Feature Diagrams that have been created. The first reason for this is that certain features have been expanded compared to features in the existing applications. The 'Information About The App' and 'Product Information' features have received more attributes and action-based features, since this was something desired by the respondents from the questionnaire and interviewees. Furthermore, the 'List Of Matches' can be filtered and sorted at all times and during browsing the filter can be used as well. Finally some new features haven been introduced, namely the 'Categories', 'Sustainable Living Information', 'Recipe Information' and the 'Main Menu', which are also in line with the findings from the questionnaire and interviews and have been described in section 3.3.

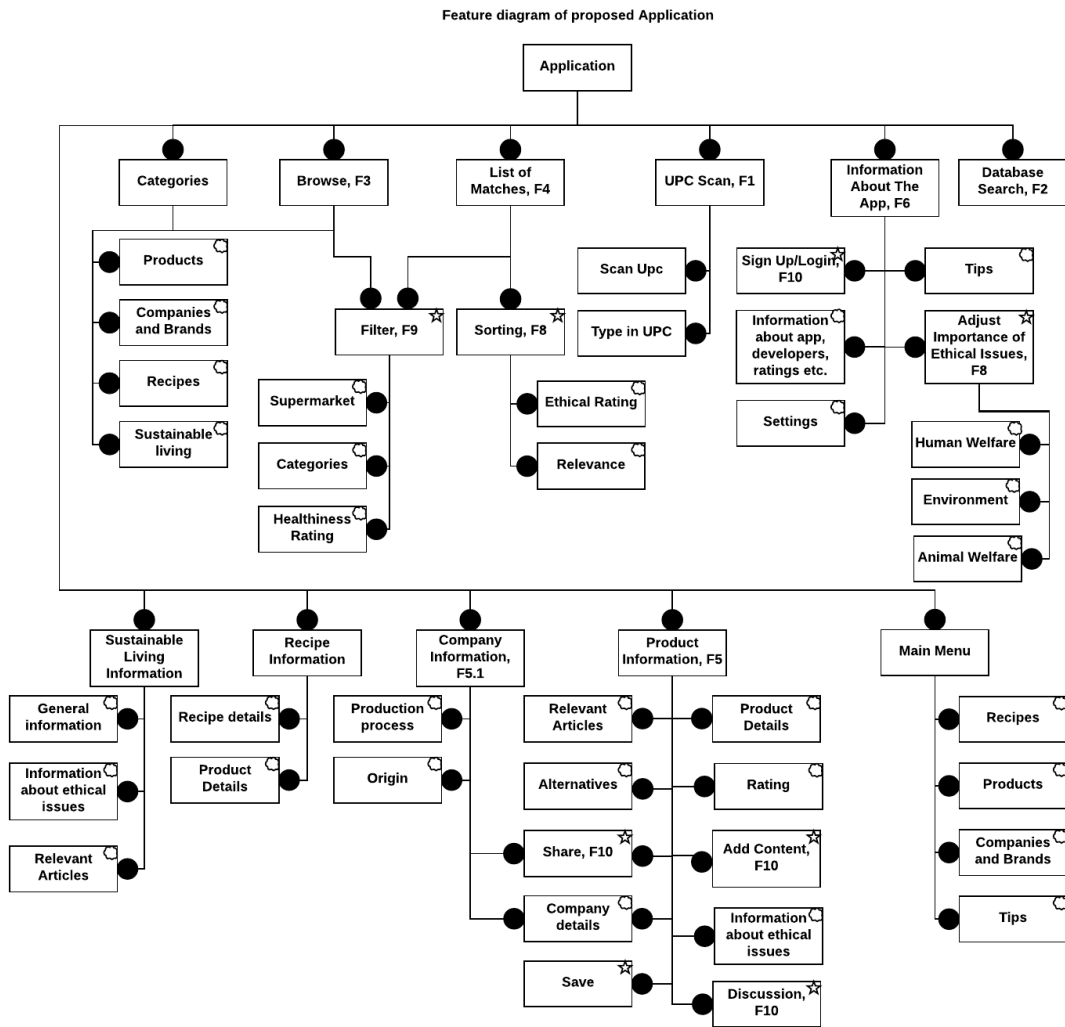


Figure 3.30 Feature diagram of the proposed application

3.4.2 Task Diagram

The following diagram is the Task Diagram of the proposed application. Since the main sequence of tasks is mainly the same over the existing applications, the proposed application will not differ as can be seen in figure 3.29. In this figure, not all functionalities have been added to ensure a better visibility of the main sequence of tasks.

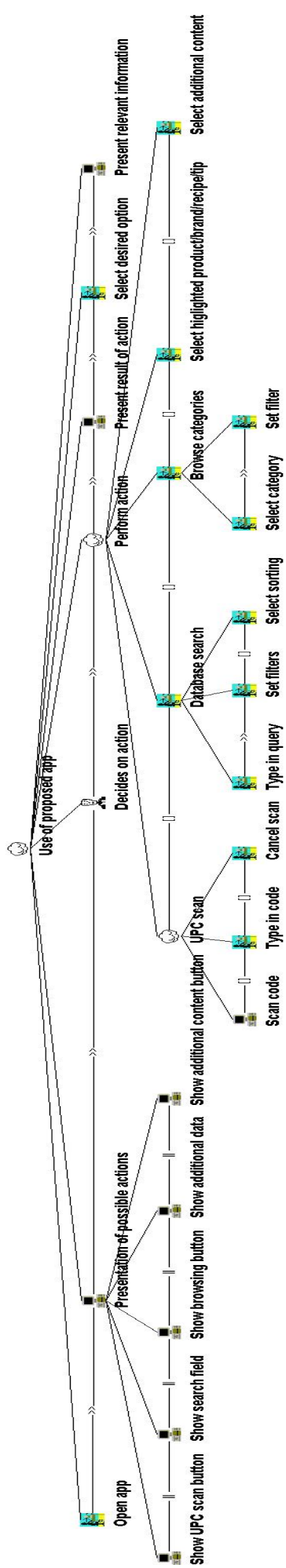


Figure 3.31 Task model of the proposed application

3.4.3 Architecture model

Now that we have a good overview of the features and main tasks in the application an overview of the software elements in the whole application is necessary. For this an architecture model has been created, which is a representation of the structures within a software system. It shows which software elements are being used in different layers of the application, how those elements are related to each other and what information is being passed between them.

The following figure gives a general representation of the proposed architecture of the system. The model shows that the client side consists of a fairly few elements. The reason for this is that it is expected that the clients will have a working Internet connection most of the time, which means that there is no need for local processing except for handling the saved pages and user specific settings. Within the presentation layer there are two components, namely the user interface and user interface logic components. The user interface components refer to the elements in the application that show the user all relevant screens and accept the input from the user. The user interface logic component refers to the actual code that handles the logical behaviour of the application, which are the things the application must do. For instance, allowing the user to navigate through the different screens.

On the server side, all processes related to creating the output for the user are being handled. The model shows that there is an internal and external database. The internal database is the collection of all relevant data for the application, such as product information, recipes, user data etc. This database requires data from external sources, which is depicted as the external database. Thus, the external database is a collection of databases that store information about all kinds of ethical issues. The service agent is a component that has access to these databases, receives the relevant data from them and passes the data to the data access component, which in turn stores the relevant data in the internal database. Now, when a user input has been received by the user interface it is being passed to the business layer. In this layer the business components are the functions that create the functionality of the application. Here the information from the internal database, which is passed through by the data access components, is being combined to create the information pages and handle user's activities. These processes require a sequence of steps that must be completed and since we want to separate the responsibilities of the components a workflow coordinator is in place that coordinates the multistep business processes. The result from this process is being passed back to the presentation layer, which in turn shows the desired result to the user.

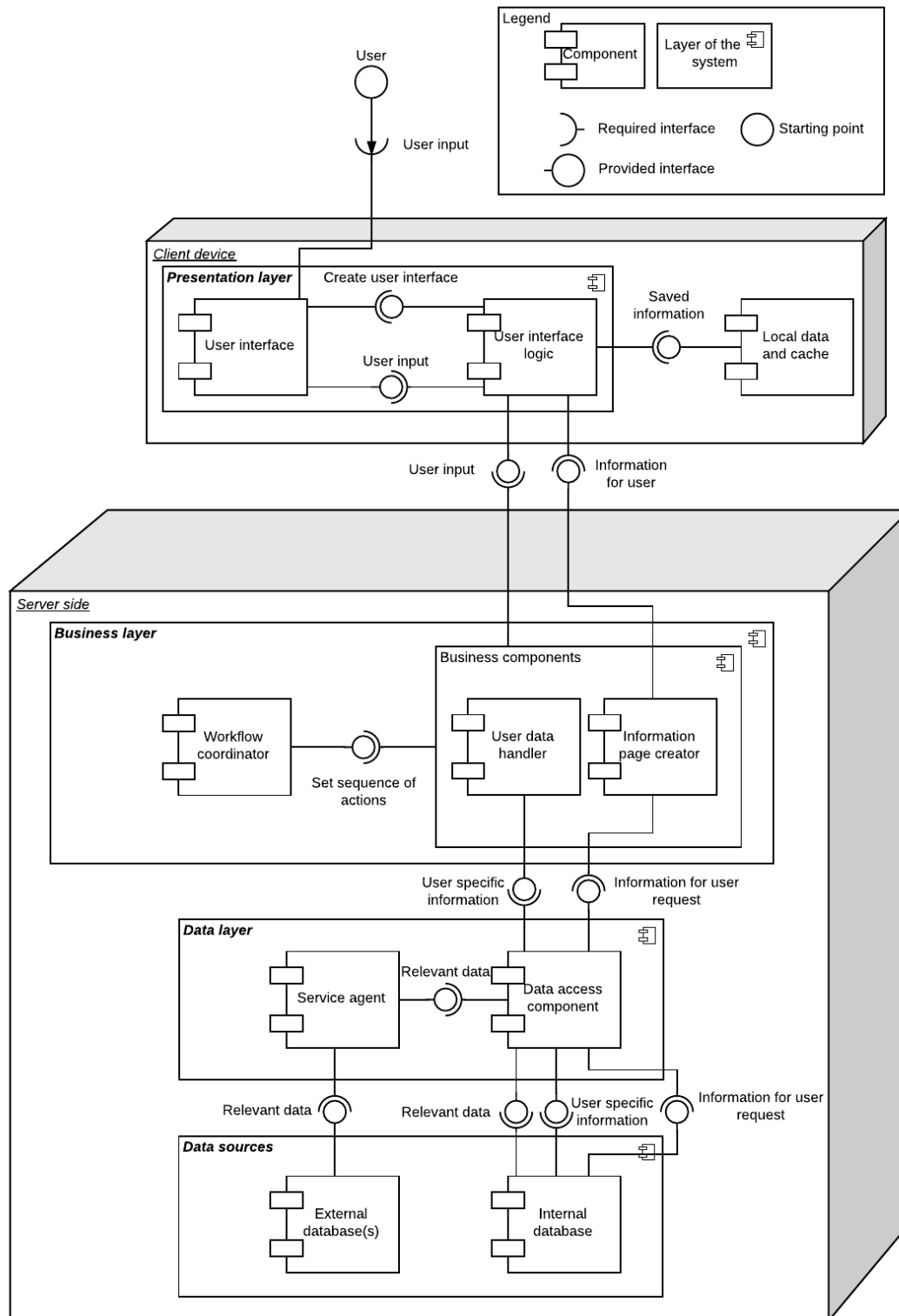
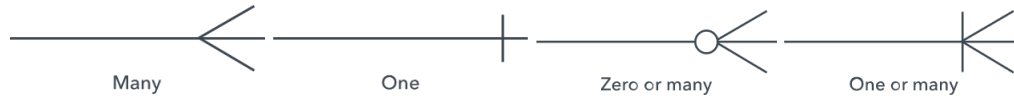


Figure 3.32 Architecture model of proposed application

3.4.4 Data models

The architecture model from the previous section gives a global overview of the 'outside' of the proposed application. The next two models will provide a better understanding of the internal structure of the proposed application. Firstly an entity-relationship diagram (ERD) has been created. The purpose of

this diagram is to show what data entities exist for displaying the desired information and how these entities relate to each other. For each entity it is shown which attributes belong to it. Furthermore, the entities are related to each other through connections that show the cardinality of the relationship. The following cardinalities can be found in the following ERD:



Additionally, verbs are used to show the type of the relationship.

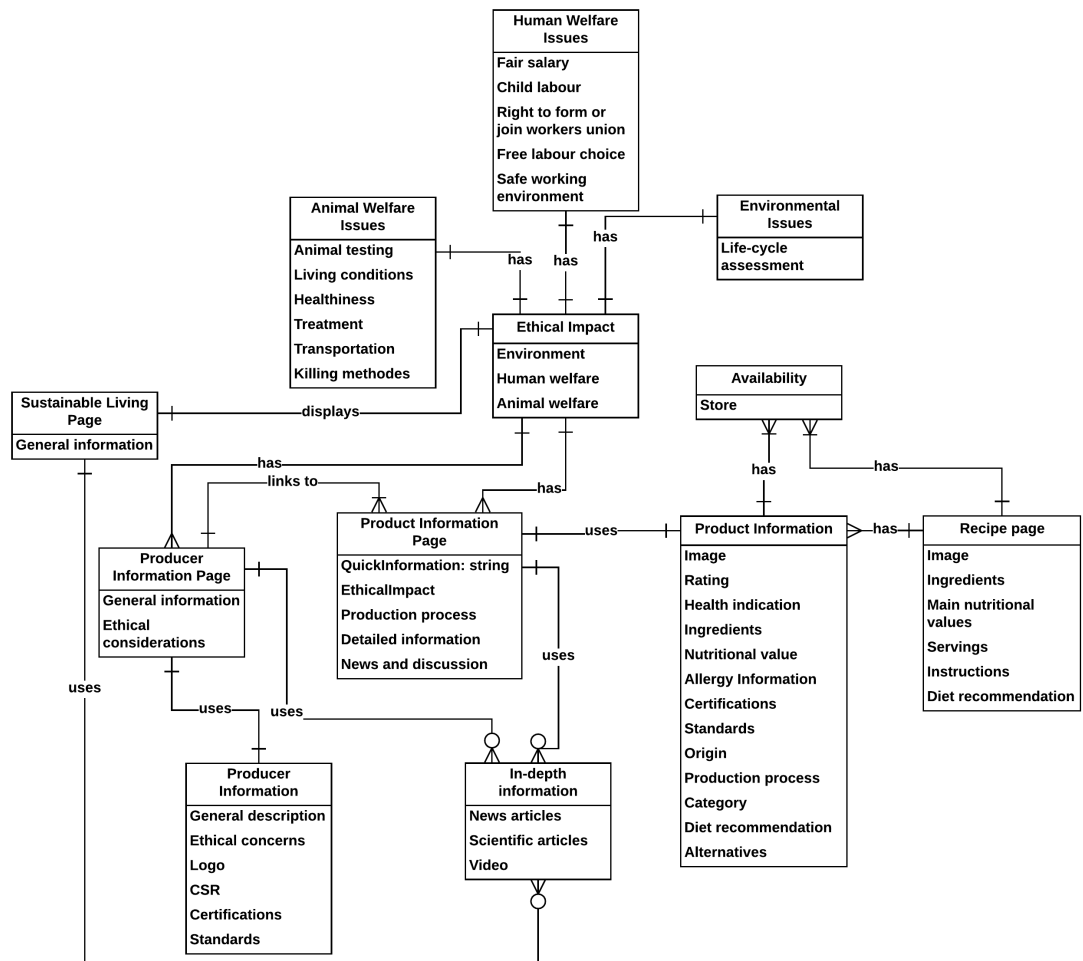
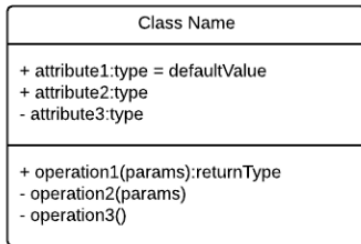


Figure 3.33 ERD of the information within the proposed application

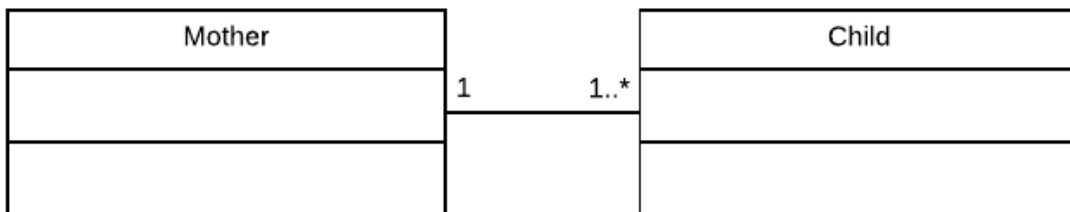
Now, to go one step further toward the actual creation of a working prototype a class diagram has been created. This diagram gives an overview of the structure of the application by showing the classes, attributes, methods and relationships between the classes that provide the main functionality of the application, namely the creation of the pages that give the desired information to the user. This diagram has been made using the Unified Modelling Language (UML) with the following components:

- Class component. The class component displays the name of the class in the top section. In the middle section the attributes of the class, their

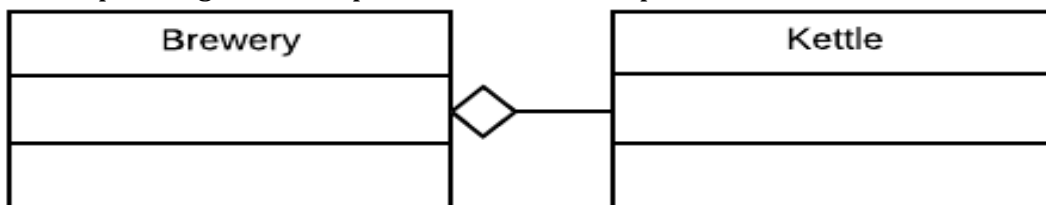
types and their visibility are shown. The bottom section shows the methods with visibility that the class encompasses.



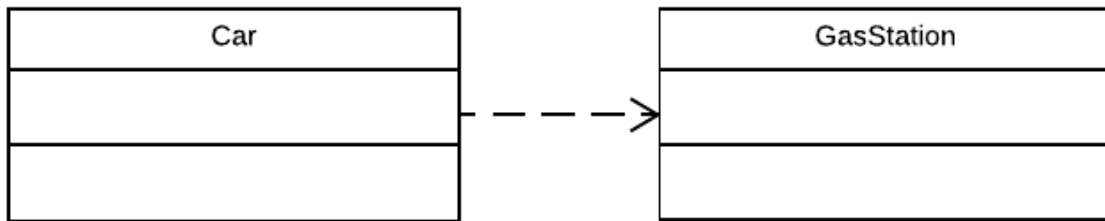
- Visibility. The visibility of the attributes and methods is given in the middle section of the class component. A '+' indicates a public attribute or method, a '-' indicates a private attribute or method and a '#' indicates a protected attribute or method.
- Bi-directional association. This type of association links two classes together by a straight line and together with the multiplicity value that comes with the association it is clear how many instances of both classes may exist at the same time. The used multiplicity values in the following class diagram are '1' -one and '1..*' -one or many. The type of this relationship can often be best described as a 'has a' relationship as can be seen in the example below. A mother has at least one child but can have more children and a child has one mother.



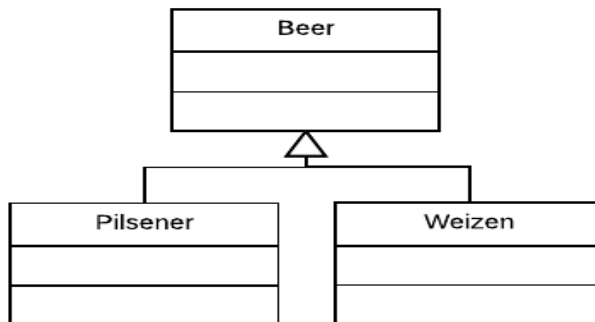
- Aggregation. This relationship is a variation on the association. It also indicates a 'has a' relationship but it is more specific, namely it shows a part-of relationship. This relationship is depicted as a line with a diamond pointing from the 'part' to the class it is part of.



- Dependency. This relationship indicates that one class depends on the other class in the sense that it uses the independent class at some point. A dashed open arrow that points from the dependent class to the independent class depicts this relationship.

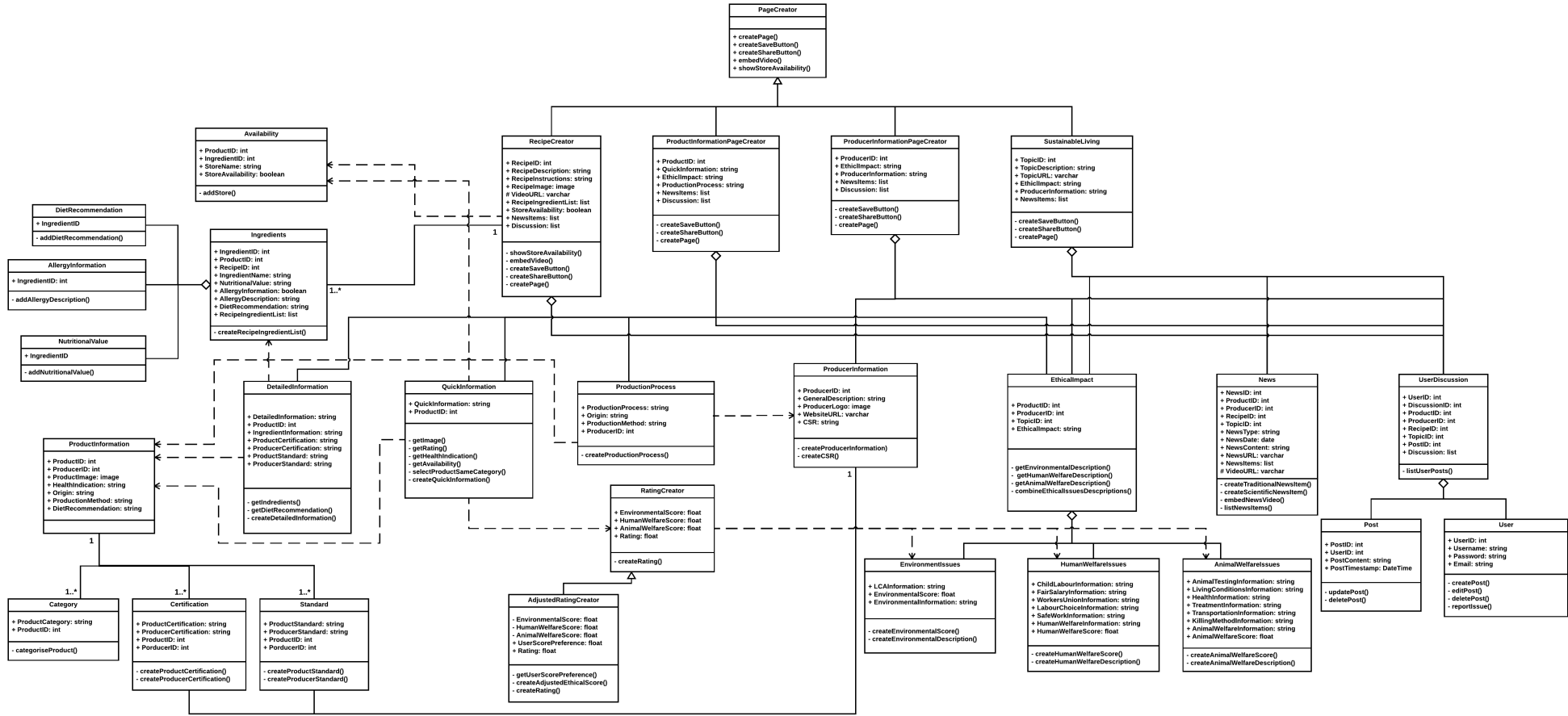


- Inheritance. This relationship indicates that the sub-class is a specialised version of the superclass. The type of this relationship is best described as a 'is a' relationship and is depicted as a closed arrow pointing from the sub-class to the superclass.



The following figure shows the class diagram of the proposed application. This class diagram is a first version of the intended behaviour of the application and it is by no means a final version. Since software development is an iterative practice the structure will change once software developers start participating in the project. With having this in mind the purpose of the class diagram is to show the intended relations between the main functionalities of the application.

Figure 3.34 Class diagram for the proposed application



3.4.5 Wireframes

In addition to the diagrams and models that have been created so far, a few wireframes have been created to give a small visualisation of the proposed application. The following figure shows how these wireframes together in a navigational model, which displays how each wireframe may be reached by user interaction. Within this model we can see that there are multiple ways of reaching the information page and returning to the main menu. This is an important practice since each user will have a different mental model of the application and thus, will try to reach his or her goal in different ways.

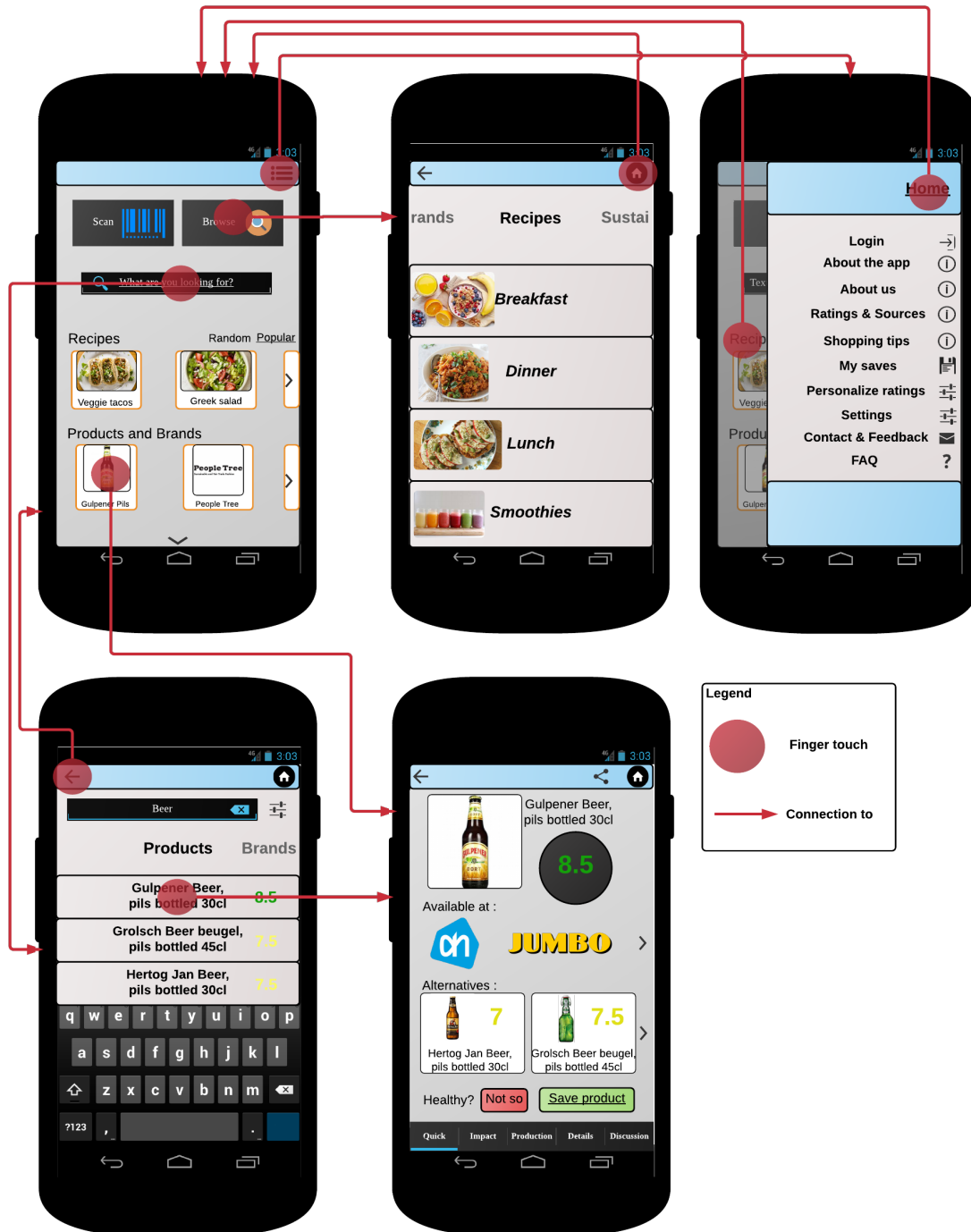


Figure 3.35 Navigational model for wireframes of the proposed design

3.4.6 Product Ratings

For rating the products and companies different tools will be used to create a grade for each product. For instance, the environmental factor can be calculated by using SimaPro. This is a software for creating a Life Cycle Assessment of a product by using information from several databases that include information about the materials, water usage, land usage etc. The social impact will be graded by the certifications that companies have or don't have, what their policies are towards their employees and if there are any known issues or violations of these policies.

For a more detailed and well-structured rating of the products, we propose to inquire an environmental scientist about the best and most reliable solutions for creating a well-informed rating for consumer products.

4 Treatment validation

This chapter discusses the validation of the proposed application (treatment) from chapter three. The goal here is to find out if the proposed application will actually contribute to the stakeholder goals described in chapter two, in the case that the application would be implemented.

As has been discussed before, each user will have different goals when using the application, but there is a common factor in the usage, namely the need to get informed. This need may be different for each user; some users just want to know quickly how a certain product scores in the rating, other users may like to cook a healthy and ethical recipe and others want to know absolutely everything about a product and its producer. These are just a few of the many stakeholder goals but it is clear that the users want to decide for themselves which way of using the application would suit them best.

The best way of finding out how the application would enable users to achieve their goals is by creating a prototype but this is beyond the scope of this project. Further discussion about a prototype will be provided in the next chapter.

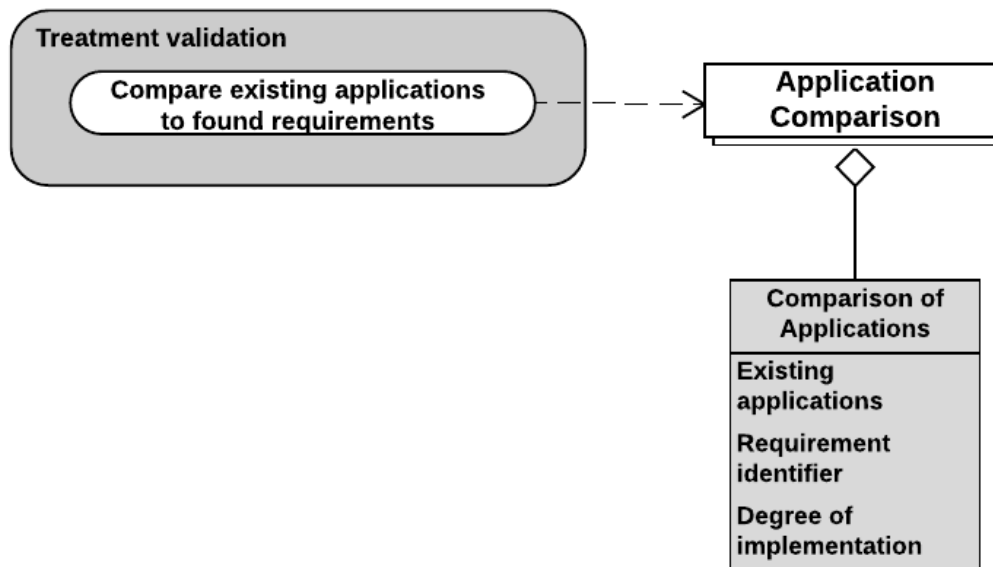


Figure 4.1 PDD of the treatment validation

4.1 Comparison of applications

Another way that may validate the proposed design is to see how the other applications have realised the stakeholder goals that have been found during this research project. Essentially, the stakeholder goals are captured in the requirements and hence, we will provide a comparison in which one can see if the existing applications have realised these stakeholder goals. Additionally, this

comparison indicates if there even is a need to develop a new application, since it might be the case that one or more applications have realised most of the found requirements. Thus, the figure below will show for most requirements if an application has realised them, by using the colour scheme as shown in figure 4.2. Some requirements however, will not be listed in the matrix since they are based on the subjectivity of the researcher. An example of this would be NFR1: “The design of the application must be aesthetically pleasing.”

Legend	Realised	Partially realised	Not realised
	1	2	3

Figure 4.2 Colour scheme for the comparison

	GoodGuide	Bunny Free	Boycott	Question-mark	Groente- en fruitkalender	VISwijzer	Cruelty Free	Healthy Living
NFR2	1	1	1	1	1	1	1	1
NFR3	1	3	3	3	1	1	3	1
NFR4	3	3	3	3	3	3	3	3
NFR5	1	1	2	1	1	2	1	1
NFR6	1	1	1	1	3	3	3	1
NFR7	2	3	2	1	3	2	3	3
NFR8	1	1	1	1	1	2	1	1
NFR9	1	3	1	1	3	1	3	3
NFR10	1	3	1	1	3	1	3	3
NFR11	1	3	1	1	3	1	3	3
NFR12	3	3	3	1	3	1	3	3
NFR13	3	3	3	1	3	1	3	3
NFR14	3	3	3	3	3	1	3	3
NFR15	3	3	3	1	2	1	3	2
NFR16	3	3	3	1	3	1	3	2
NFR17	2	3	3	2	3	3	3	2
NFR18	1	1	1	1	1	1	1	1

Figure 4.3 Comparison for the non-functional requirements

	GoodGuide	Bunny Free	Buycott	Question- mark	Groente- en fruitkalender	VISwijzer	Cruelty Free	Healthy Living
FR1	Green	Green	Green	Green	Green	Green	Green	Green
FR2	Red	Green	Green	Red	Red	Yellow	Yellow	Green
FR3	Green	Green	Green	Green	Red	Red	Yellow	Green
FR4	Green	Yellow	Red	Yellow	Red	Red	Green	Green
FR5	Red	Red	Green	Green	Red	Red	Red	Red
FR6	Green	Green	Green	Green	Red	Red	Yellow	Green
FR7	Green	Green	Green	Red	Red	Red	Green	Red
FR8	Green	Green	Green	Green	Green	Green	Green	Green
FR9	Green	Green	Green	Green	Green	Green	Green	Green
FR10	Yellow	Red	Red	Red	Red	Red	Red	Green
FR11	Green	Red	Red	Green	Green	Green	Red	Green
FR12	Green	Yellow	Red	Green	Red	Red	Red	Green
FR13	Green	Green	Green	Green	Red	Green	Green	Green
FR14	Yellow	Yellow	Yellow	Red	Red	Red	Yellow	Yellow
FR15	Green	Red	Green	Green	Red	Red	Red	Green
FR16	Red	Red	Green	Red	Red	Red	Red	Green

Figure 4.4 Comparison of the functional requirements, part 1

	GoodGuide	Bunny Free	Boycott	Question- mark	Groente- en fruitkalender	VISwijzer	Cruelty Free	Healthy Living
FR17	Red	Red	Red	Red	Yellow	Red	Red	Yellow
FR18	Green	Red	Red	Green	Green	Green	Red	Green
FR19	Yellow	Red	Yellow	Yellow	Red	Red	Red	Red
FR20	Red	Red	Red	Red	Red	Red	Red	Red
FR21	Green	Green	Red	Green	Red	Green	Green	Green
FR22	Red	Red	Yellow	Red	Red	Red	Red	Green
FR23	Red	Red	Red	Yellow	Red	Red	Red	Red
FR24	Red	Yellow	Red	Yellow	Red	Yellow	Red	Red
FR25	Red	Red	Red	Red	Red	Red	Red	Red
FR26	Red	Red	Yellow	Red	Red	Red	Red	Yellow
FR27	Green	Green	Green	Green	Green	Green	Green	Green
FR28	Yellow	Red	Red	Red	Red	Red	Red	Red
FR29	Yellow	Red	Yellow	Yellow	Red	Red	Red	Yellow
FR30	Red	Yellow	Red	Green	Yellow	Yellow	Yellow	Green
FR31	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow
FR32	Yellow	Red	Yellow	Yellow	Red	Red	Red	Yellow
FR33	Yellow	Red	Yellow	Yellow	Red	Red	Red	Red
FR34	Yellow	Yellow	Yellow	Red	Red	Red	Yellow	Red
FR35	Red	Red	Red	Red	Red	Red	Red	Red
FR36	Red	Red	Red	Red	Red	Red	Red	Red
FR37	Yellow	Red	Yellow	Red	Red	Red	Red	Red
FR38	Red	Red	Red	Yellow	Red	Red	Red	Green
FR39	Red	Red	Red	Green	Red	Red	Red	Green

Figure 4.5 Comparison of the functional requirements, part 2

From the figures above it can be concluded that all the existing applications have not or just partially realised the found requirements. There are multiple reasons for this difference. Firstly, some applications focus only on specific products (e.g. VISwijzer) or ethical issues (e.g. Bunny Free). Another reason is that some applications are not only focussing on products (e.g. Boycott). Furthermore, it might be the case that the developers of certain applications have found that certain stakeholder goals may not be achieved and trade-offs had to be made.

Whichever the reason might be for the difference, it is clear that the stakeholder goals found in this research project are not completely fulfilled by any existing application. Hence, we think that developing a prototype is a viable option as a next step after this research project.

5 Discussion, limitations and future considerations

This research project aimed at finding the requirements as has been stated as research question 3: “*What requirements would a future application need to enable consumers to make informed ethical decisions about the products or services they buy?*”. After a thorough analysis of the existing applications and acquiring input from potential users this question has been answered in chapter 3. However, software development is an iterative process and should be user centred (Jurca et al., 2014; Benyon, 2005). The requirements that have been found come from applications that will change over time and potential users who had to visualize the application without an example. Therefore, the requirements are not finite but they form, together with the models created in section 3.6, a solid base on which a prototype may be build. The prototype in turn can be shown to new potential users, either through another questionnaire, interviews or focus groups, to gain a better insight in which features are being appreciated and which could be better let go. This will lead to new requirements and an improved design of the prototype. Furthermore, the amount of potential users that have been questioned should be extended to enable the researchers in making better generalizations and prioritizing features in a statistical manner.

Unfortunately, due to a lack of time and resources these steps will not be performed in this research project but perhaps, in the future, it will be developed.

5.1 Validity of the research

Since no statistical validity could be provided for this research we sought for other ways to see if the practises in this research could yield data that is applicable in the ‘real’ world. For this purpose we reached out to the developers of the existing applications to inquire about their product development. GoodGuide and Questionmark were the applications that could provide us with in-depth information. Other applications replied as well, unfortunately only to inform us that a third party was hired to develop the application.

From GoodGuide’s and Questionmark’s replies we learned that the findings in this research and the future considerations from the section above are in line with their development process. Both applications were developed without initial user input; only what the developers considered as important was created. Once the applications were made, user input was gathered through questionnaires, interviews, focus groups and by observing users as they use the application. This information shows that this research project actually does more than established applications have done in their design phase. In the future however it is agreed that a continuous user involvement is essential in developing and maintaining a well functioning and satisfying application.

5.2 Validity of the results

Now that the research has been done we have to ask ourselves if the research has provided us with results that are applicable for the population.

Firstly, we ought to discuss the applications that were researched. From a thorough search through the App Store and Play Store, the applications that have been discussed in this research project were the most used applications in the field of environmental consumerism, and hence we believe that these applications are a representative sample.

Secondly, the results from the survey and interview should be discussed. The sample for the survey was very varied, including subjects from different age groups and nationalities. In the sense of diversity we believe that this sample is a very good representation of the population of ethical consumers. However, by looking at the number of respondents, the sample could be larger do give a better representation of the population. Furthermore, the sample was not randomly selected. A large part consists of people from our social circles or 'friends of friends', some of these friends already had a certain affinity with consuming ethically, but some did not. We believe this to be a good mix of people who already know what they want to see in the application and people who might become interested if certain features would be applied in the application.

By extending the sample of these groups of people for further research, we believe that a very good representation of the population can be achieved.

6 Conclusion

As consumers we are collectively using resources from our planet in multiple forms. Oftentimes we are not aware of the processes that the products we use have undergone when we see them in our stores and if we are interested in the background of those products it is not easy to find out more about them. Through this need for information we have proposed a design for an application that enables consumers to find out more about the ethical concerns of products we buy everyday. By using different techniques we have identified the specific requirements for such an application from a user-centred perspective. It has been found that certain existing applications do not feature all of those requirements and hence, future research with these requirements on a larger scale would be required to obtain statistical valid results. Furthermore, initial models for creating a usable prototype have been proposed as well, which would be the next step after this research project. Unfortunately, this is beyond the scope of the project. Nevertheless, the research in the field of ethical consuming is a promising one, especially if combined with information technology, which has been confirmed by most of the people who have been asked for their opinion during this project.

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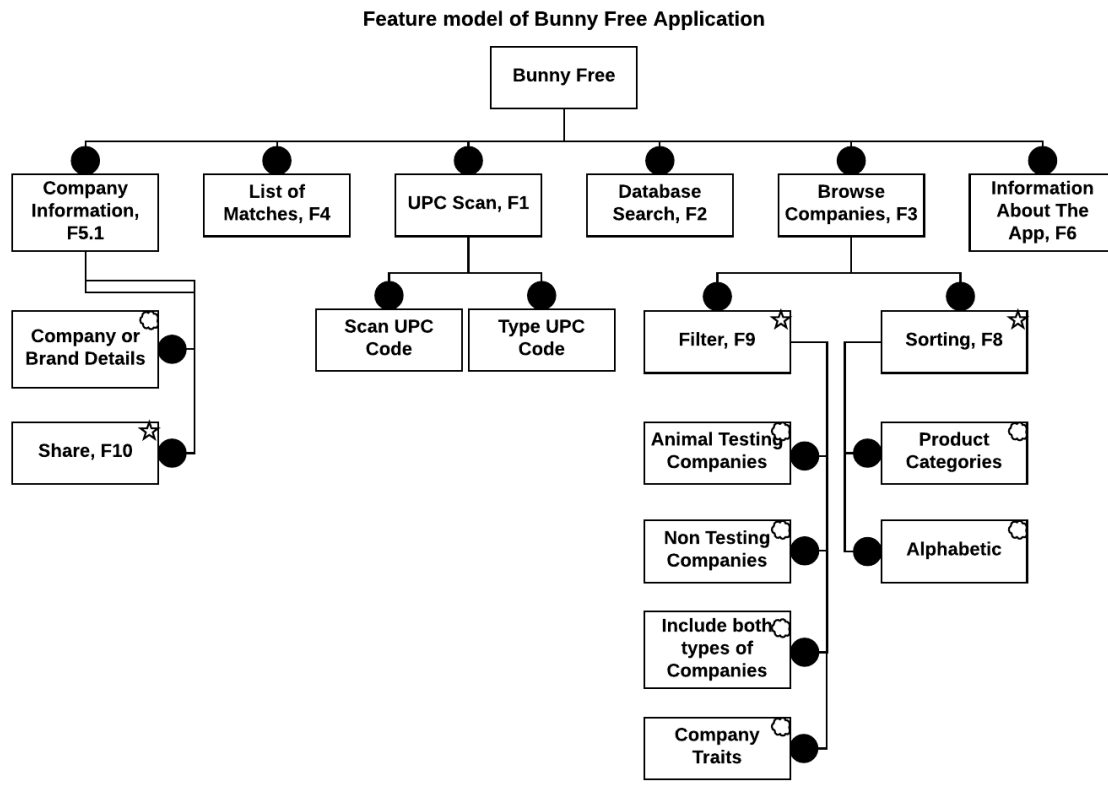
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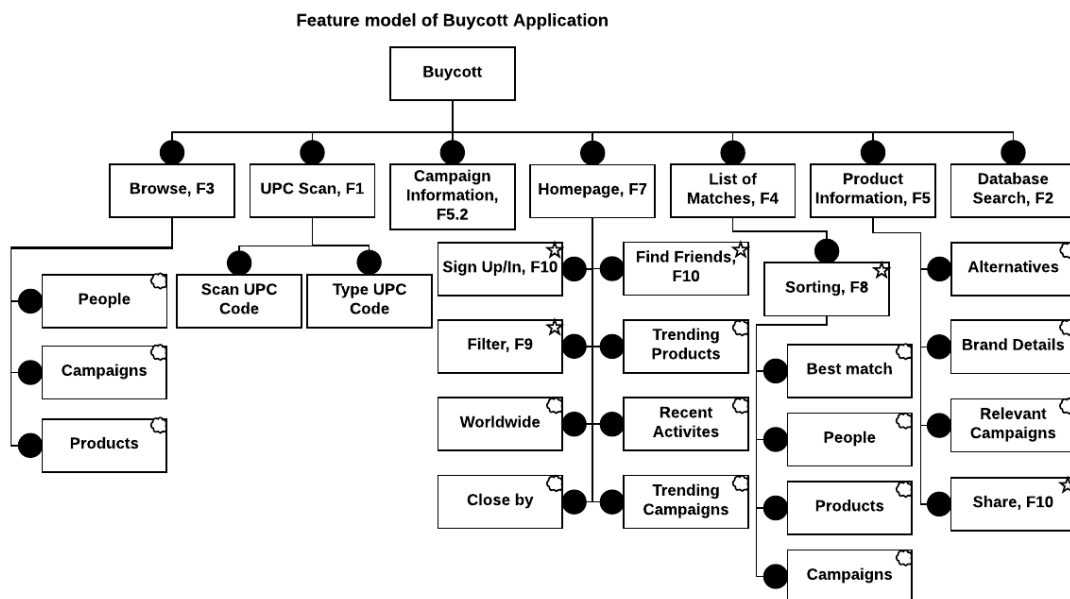
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Appendix

A

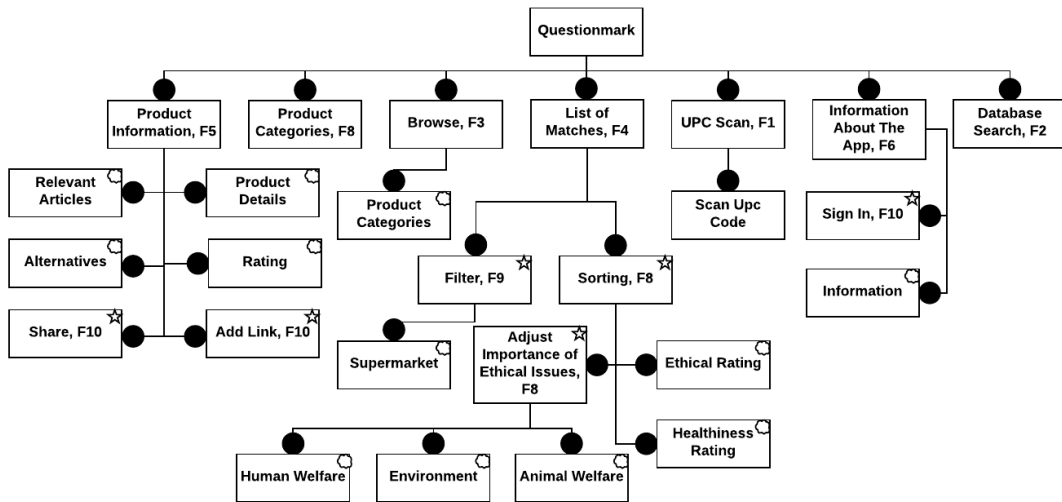


Feature model of the Bunny Free application



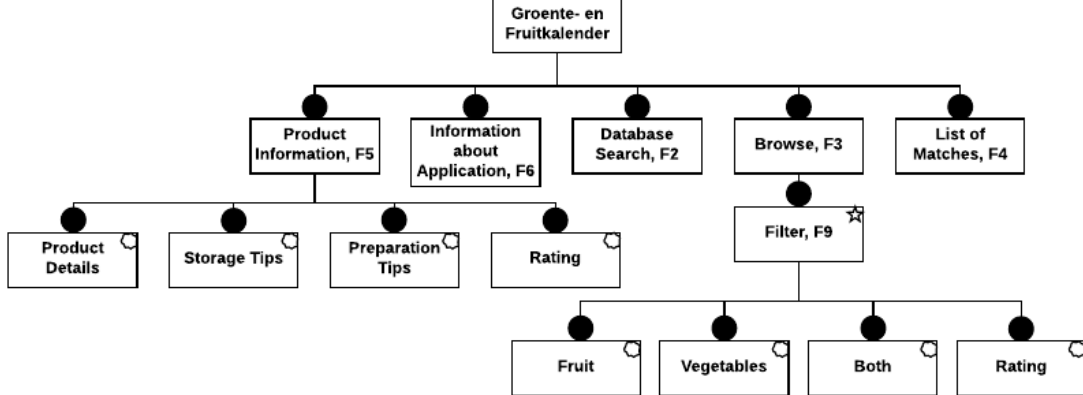
Feature model of the Buycott application

Feature model of Questionmark Application



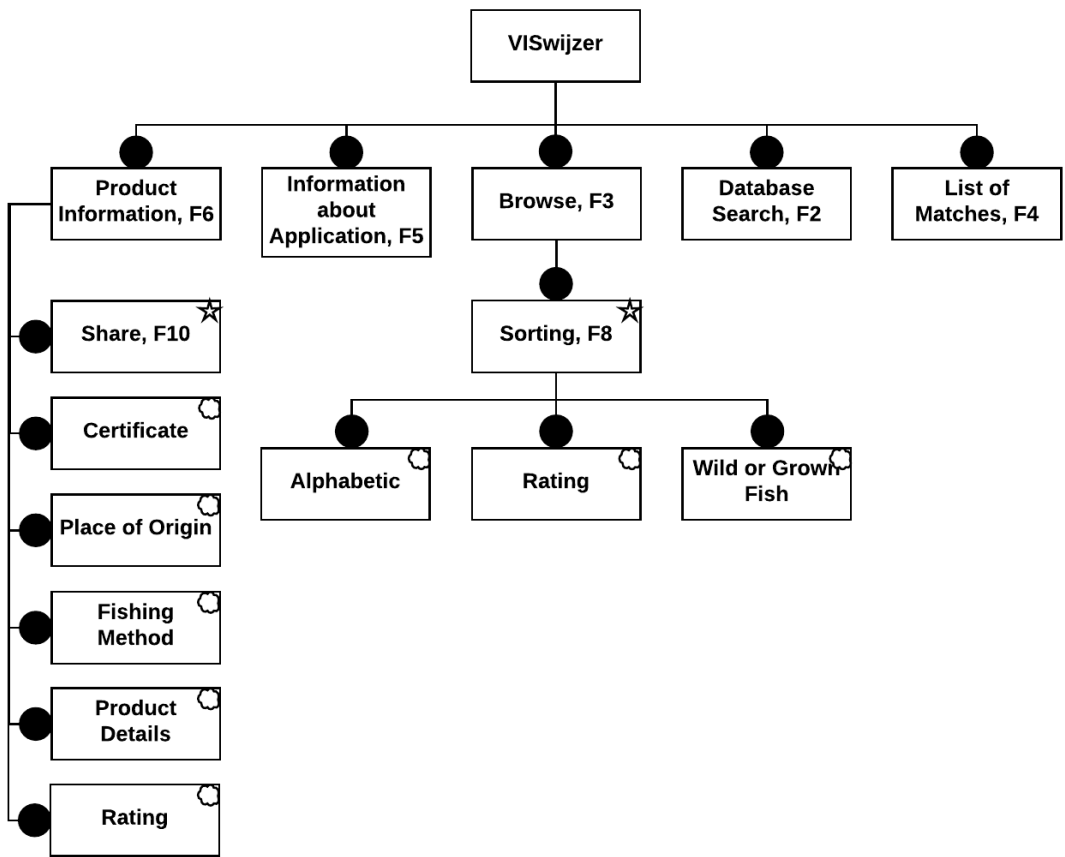
Feature model of the Questionmark application

Feature model of Groente- en
Fruitalender Application



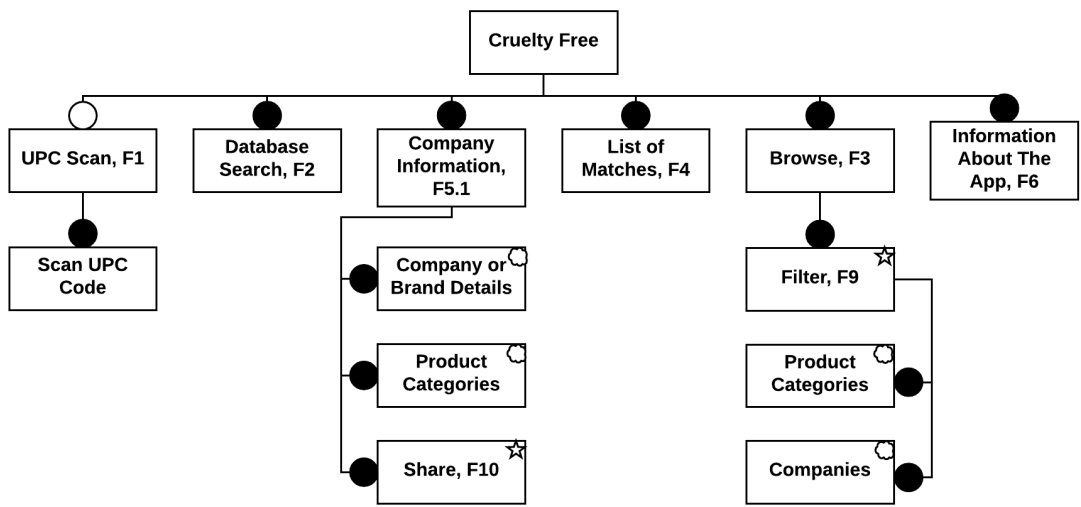
Feature model of the Groente- en Fruitalender application

Feature model of VISwijzer Application



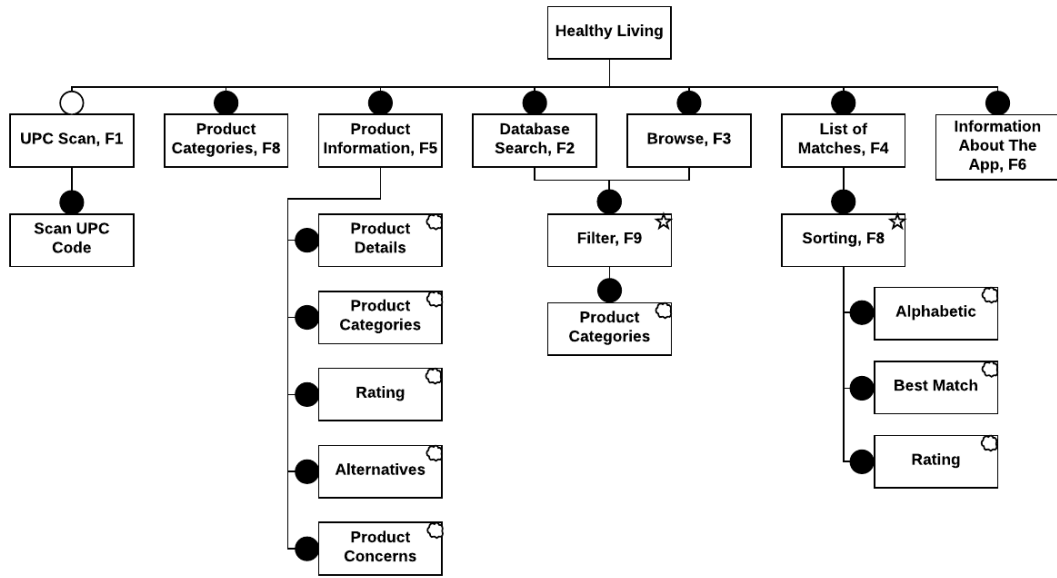
Feature model of the VISwijzer application

Feature model of Cruelty Free Application



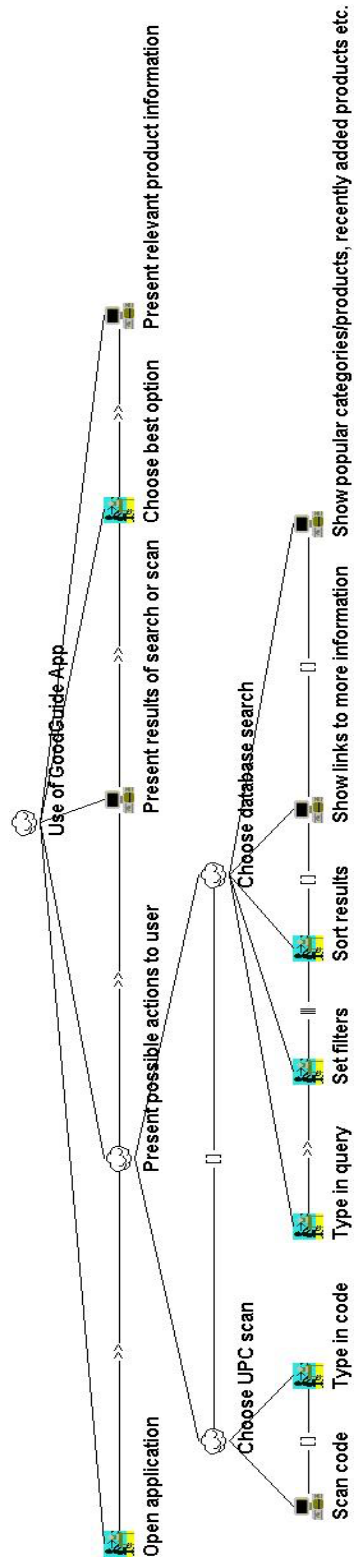
Feature model of the Cruelty Free application

Feature model of Healthy Living Application

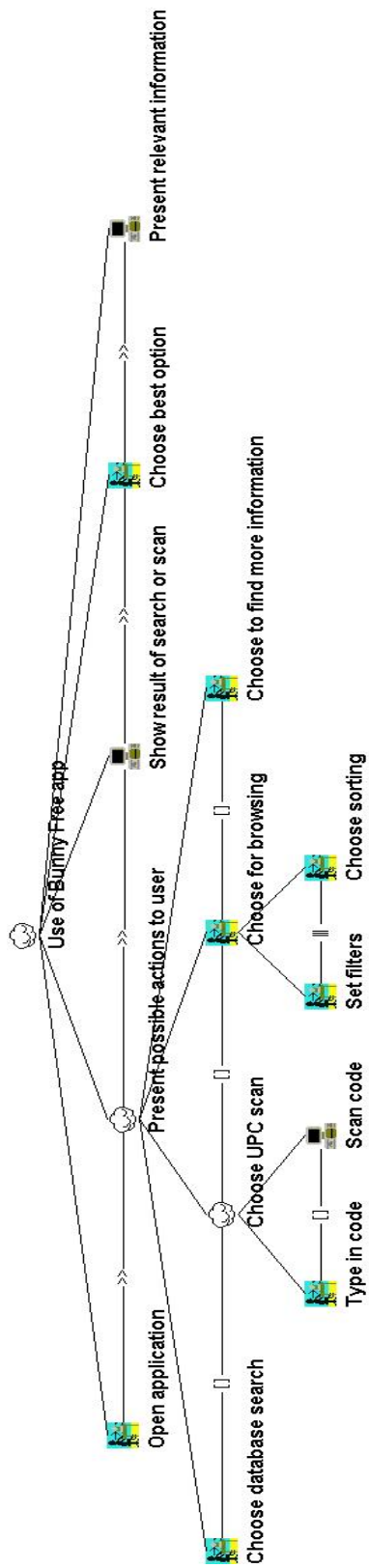


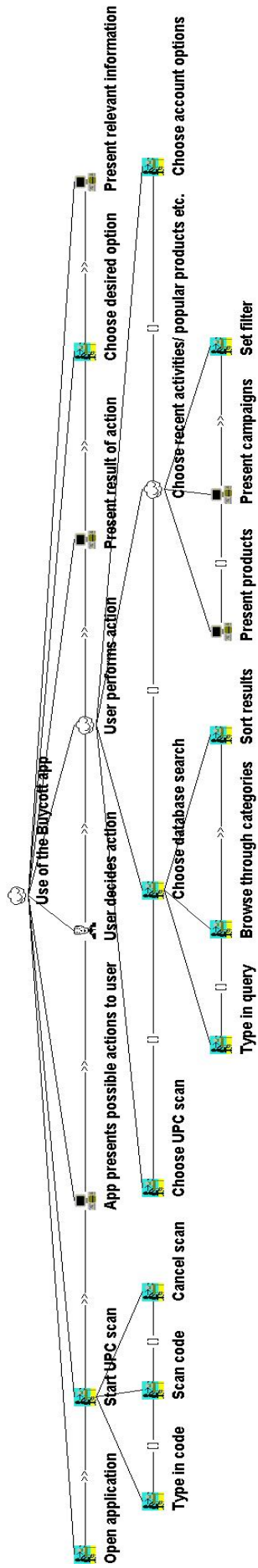
Feature model of the Healthy Living application

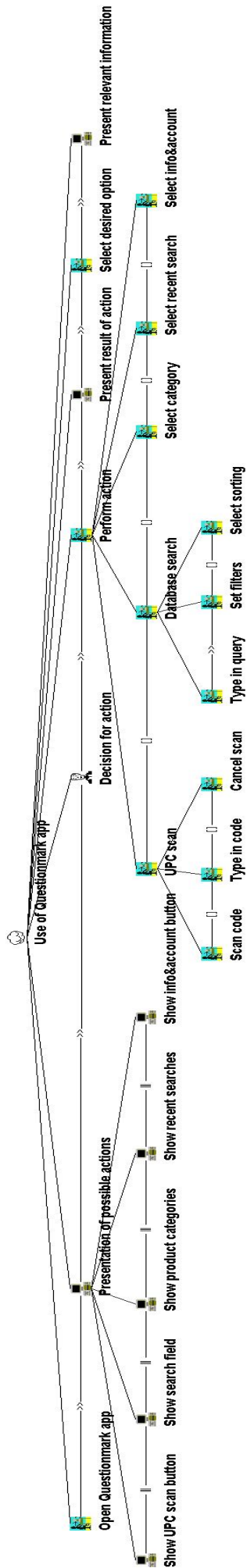
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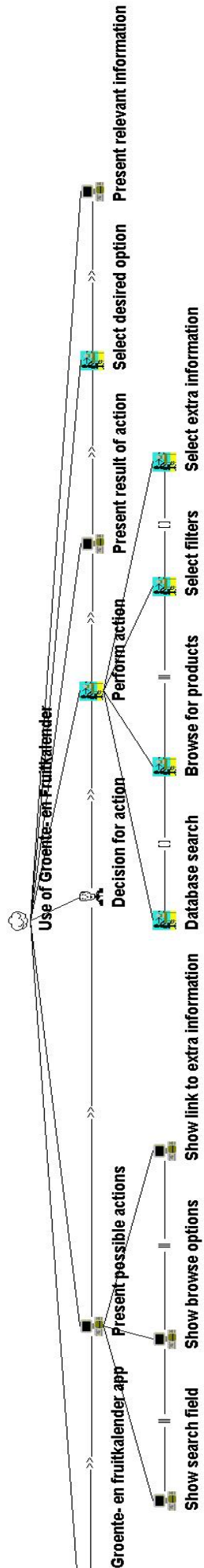


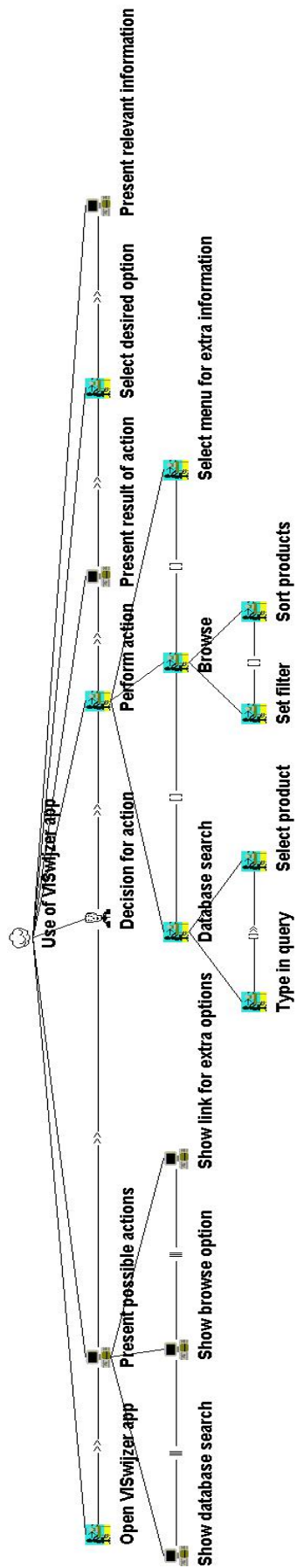
Task model of the GoodGuide application



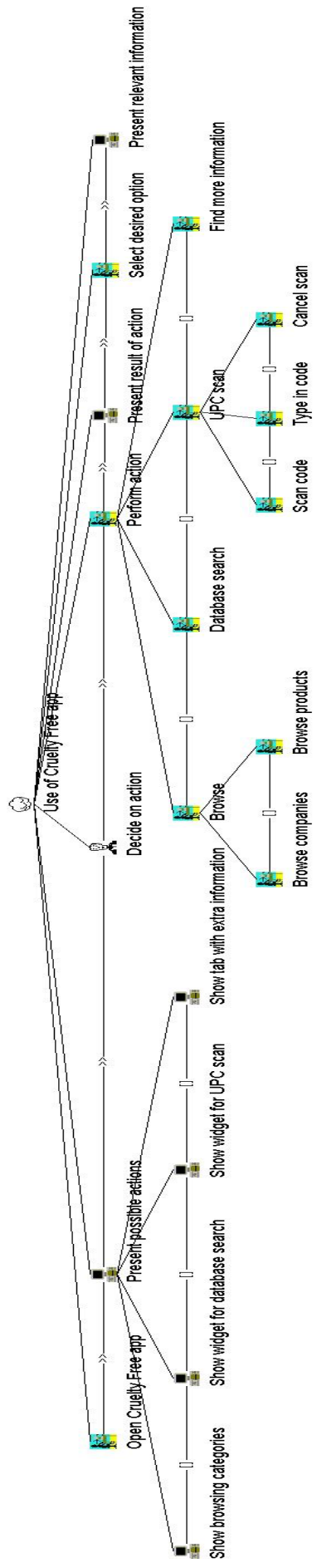




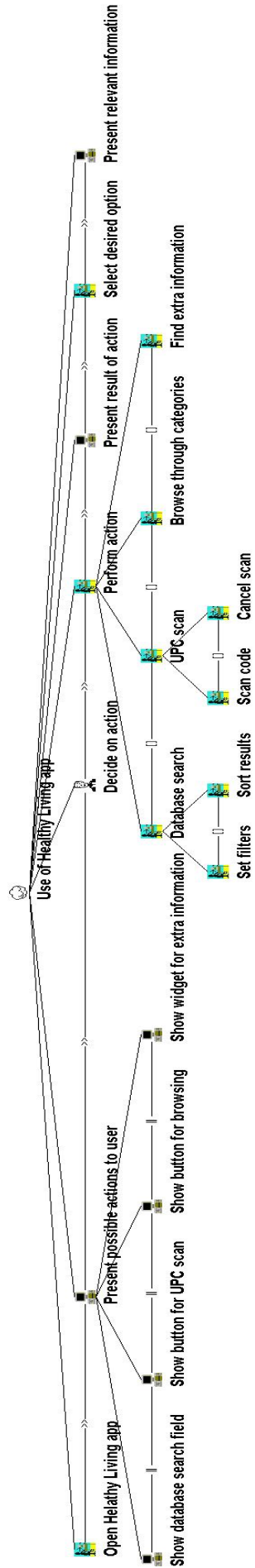




Task model of the VISwijzer application



Task model of the Cruelty Free application



Task model of the Healthy Living application

Survey for an application about ethical consumerism

Thank you for taking the time and helping me with my research! The research is about finding the requirements for a mobile app for ethical consumerism, in the sense that it should aid consumers who consume ethically (or want to) in making informed decisions about the products they buy. If you are interested in getting to know more about this or you have any other questions, feel free to contact me at t.pelle@students.uu.nl.

At the end of this survey you will have the possibility of leaving your e-mail address in case you decide to fill in the open questions, but it's not mandatory (you can also fill in the open questions without leaving your e-mail). In case you decide to leave it I might contact you for a few follow up questions. From all submitted e-mail addresses (who filled in the open questions) I will randomly pick two winners for an ethical treat!

Finally, all data will be handled confidentially. The outcome of this questionnaire won't identify you in my report and your e-mail will only be used by me to maybe contact you for a few follow up questions.

*Vereist

1. 1. What is your age? *

.....

2. 2. How ethical would you describe yourself as a consumer? *

For this question, being ethical is best described as caring about environmental issues, human rights and animal welfare.

Markeer slechts één ovaal.

- I don't care about consuming ethically at all.
- I do care about consuming ethically, but right now I lack the resources for that. (E.g. no money, time etc.)
- I do care about consuming ethically. Sometimes or for some products.
- I do care about consuming ethically, most of the time.
- I do care about consuming ethically, all the time.

3. 3. Please select: **Markeer slechts één ovaal per rij.*

	I strongly agree	I agree	I neither agree nor disagree	I disagree	I strongly disagree
I inform myself about product(s) before I buy them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
That knowledge affects my decision to buy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I care about what people who are important to me think about the product(s) I buy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have an obligation to buy ethical products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to identify ethical products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I am in control of what I want to buy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes my decision to buy a certain product changes last-minute when I'm in the store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. 4. I believe that me consuming ethically will... **Markeer slechts één ovaal per rij.*

	Very likely	Likely	Neither likely or unlikely	Unlikely	Very unlikely
result in more ethical products being sold in general	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
encourage companies to sell ethical products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
lessen the amount of non-ethical products on the market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
result in my peace of mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. 5. How often does it happen that you change your mind about buying a product last-minute? **Markeer slechts één ovaal.*

- Very often
 Often
 Sometimes
 Not often
 Never

6. In case it happens that you change your mind, does this bother you?*Markeer slechts één ovaal.*

- Yes
 Sometimes
 No

**7. In case it does bother you, do you find a reason for yourself to explain your decision?
Please give an example(s)**

.....
.....
.....
.....

About the app

The following section consists of multiple open questions and some multiple choice questions. They are not mandatory, but it would be a great help to me if you'd fill them in (you can win something!). In case you feel you're done, hit the send button at the bottom of the page.

8. 6. Do you use any tools that help you in deciding what products you want to buy?

Vink alle toepasselijke opties aan.

- Yes, I use an app
- Yes, I use a website
- Yes, I use product reviews from magazines
- I don't use such a tool
- Anders:

9. In case you do use a tool, what do you like about it?

.....
.....
.....

10. In case you do use a tool, what would you like to improve?

.....
.....
.....
.....

11. 7. What do you think of an app that provides you with information about the ethical issues concerning the product you want to buy?

.....
.....
.....
.....

12. Would you use such an app?

Markeer slechts één ovaal.

- Yes
- No
- Anders:

13. What information about products should such an app display?

.....

.....

.....

14. Should the app also enable you to get informed about more than products themselves?

Please select or add something you would like to see.

Vink alle toepasselijke opties aan.


- Sharing the product
- Seeing what others buy or like
- Information about green energy
- Information about sustainable living
- Ethical recipes
- Anders:

15. 8. Finally, I have some examples on what is applied in existing apps for ethical consumerism or I think might be important. Please rate their importance.

Markeer slechts één ovaal per rij.

	Very important	Important	Neither important nor unimportant	Unimportant	Very unimportant
Social aspects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being able to see alternatives for the product you have found	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being able to see where to buy the alternatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information about the producer of the product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popular products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A link to the website of the organisation behind the application for extra information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A 'Home page' displaying general information and user's activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adjust the importance of ethical issues (for instance, weighing social rights stronger than animal welfare)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Thank you for filling in the survey! If you'd like you can leave your e-mail address here to enter the raffle and perhaps I'll contact you for a few follow up questions. (It won't be shared with any third party)

Mogelijk gemaakt door
 Google Forms

D Interview questions

[Verification of ethical decision-making model]

Firstly I would like to get to know your view on what consuming ethically is.

1. What kind of factors should a product meet to be ethically responsible in your opinion?

2. Now, when you go to buy a certain ethical product or service, such as groceries, shampoo or dinner, are there things that you take into account beforehand? (Think about aspects that you find important or that might influence what you would buy) **[Subjective Norm, Ethical Obligation, Self-Identity, Knowledge, Neutralisation]**

3. Do you already make a decision to buy something before going out?

4. Are there reasons that you decide to not a buy product or service even though you find the underlying ethical issues important? **[Neutralisation, Situational Context, ABC]**

5. When you're at the store or place you go to for what you want to buy, are there things that influence your purchase decision? **[Situational Context, ABC]**

[Finding requirements for the application]

Now we shift the focus a bit more towards tools that might help you in making buying decisions.

6. Do you use any tools that help you in deciding what to buy and if so can you tell me a bit more about them? What do you like about it, what works, what doesn't?

7. (follow up for negative answer or if tool is not an app) What do you think of a mobile application that gives you information about the ethical issues of the product you want to buy and would you use it?

8. What information about products should such an app display?

9. Should it also enable you to get informed about more than products themselves? (think about social aspects (what do others do), information about services, such as green energy or living, how to be more green at home, healthy recipes etc.)

10. Finally, I have some examples on what is applied in existing applications or I think might be important. Can you tell me what your opinion is on those features? Or how important you find these options?
 - Social features. (For instance: sharing, find friends, see activities of others)

 - Showing alternative products and where to buy them.

 - Information about the brand/company that made the product.

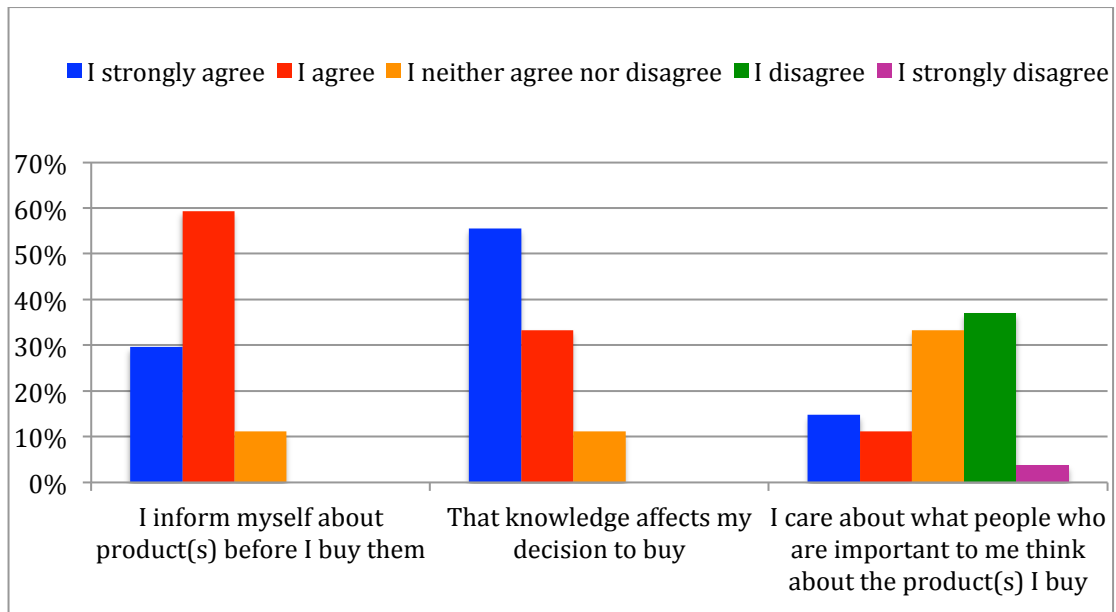
 - Showing popular product categories (for instance: dairy, bakery ec.)

- Showing popular products (for instance: tony 's chocolonely, Grolsch kornuit etc.)
- Having a link to the website of the creator of the application.
- Having a home screen or 'start' screen displaying all kinds of general information.
- Adjust the importance of ethical issues (for instance, putting environmental issues on very important)
- Changing the level of detail of ethical issues (for instance showing how a product scores on human welfare against how it scores on working conditions, hourly wages, health insurance availability, right to form unions etc. of the people producing it

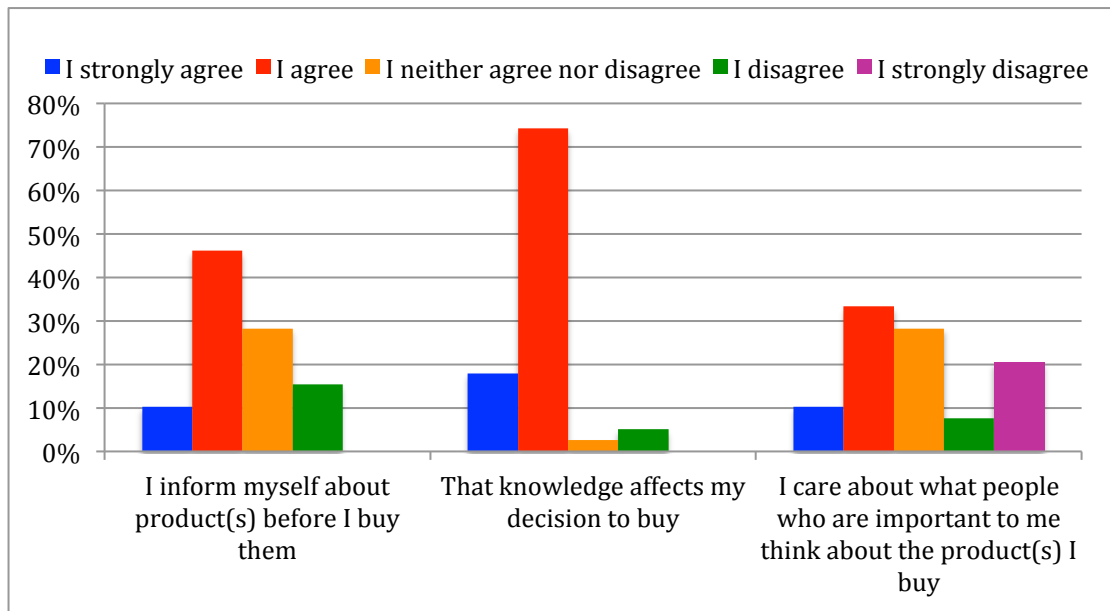
Is there anything else you would like to add?

Thank you for helping me with my research project. Once it's finished I would be happy to send it to you, if you like.

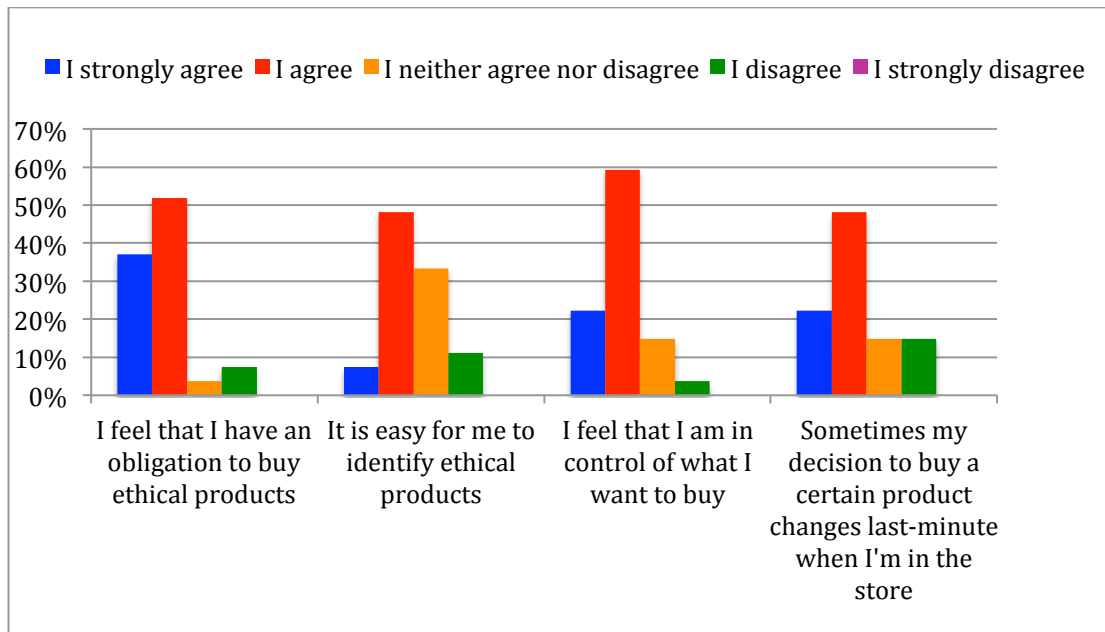
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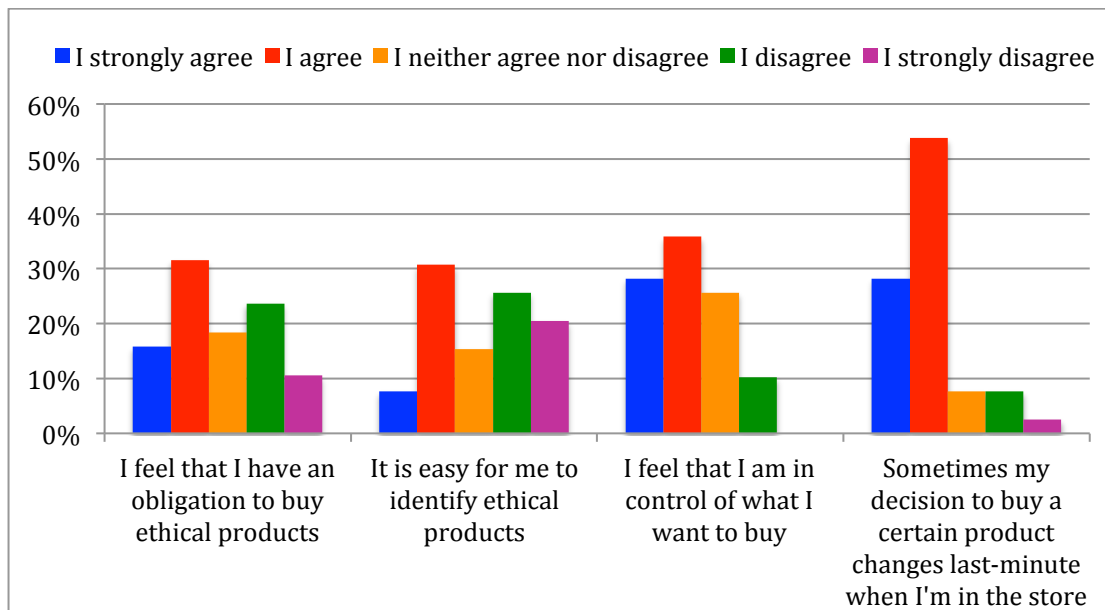
Results for the knowledge and subjective norm variables from ethically concerned consumers



Results for the knowledge and subjective norm variables from less ethically concerned consumers

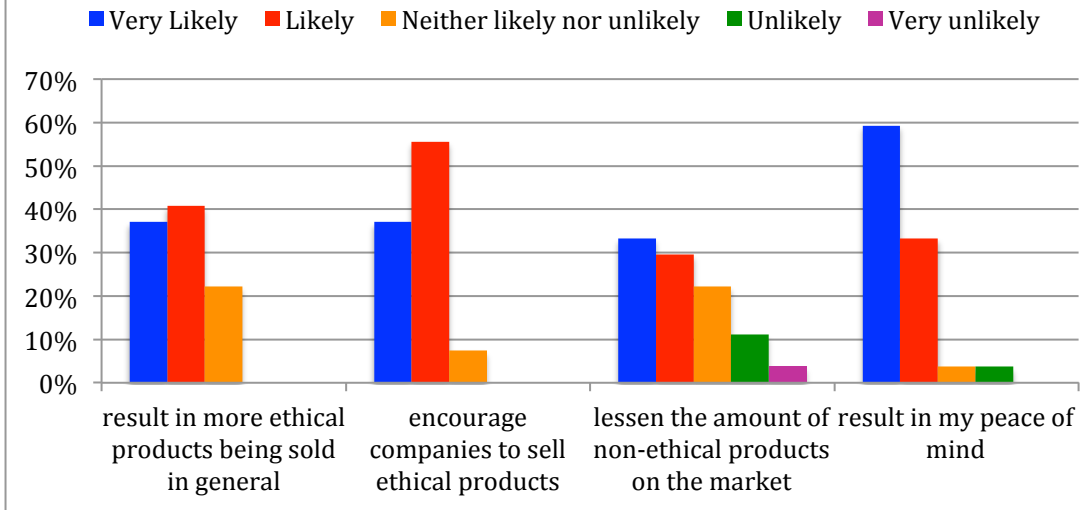


Results for the ethical obligation, ABC and situational context variables from ethical consumers



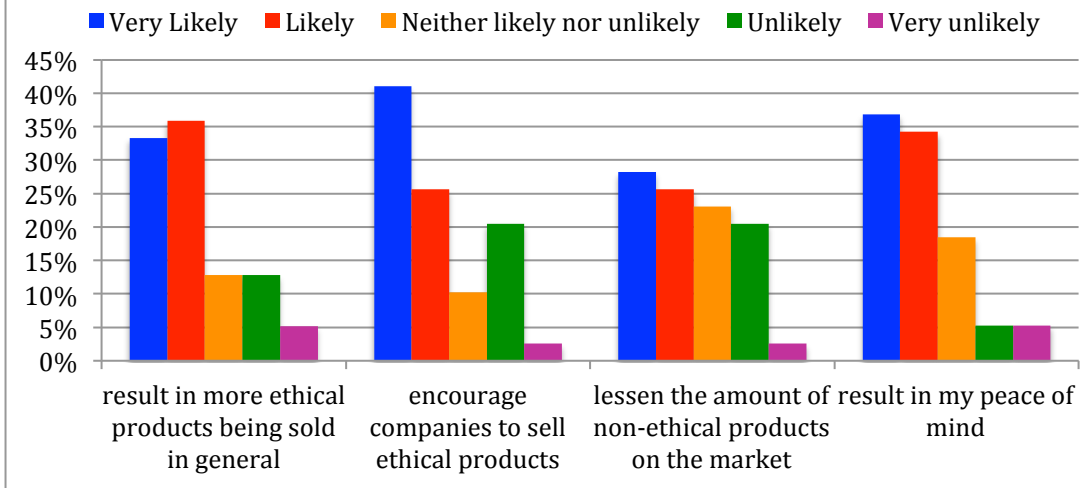
Results for the ethical obligation, ABC and situational context variables from less ethical consumers

I believe that me consuming ethically will ...



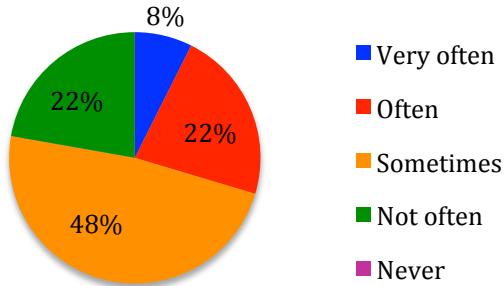
Results for the attitude toward the behaviour variable from ethical consumers

I believe that me consuming ethically will ...

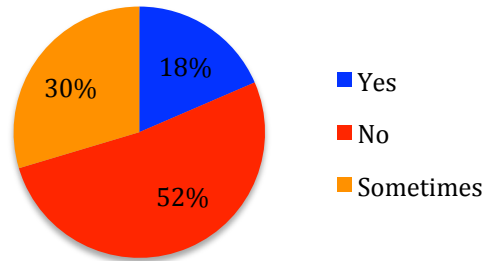


Results for the attitude toward the behaviour variable from ethical consumers

How often does it happen that you change your mind about buying a product last-minute?

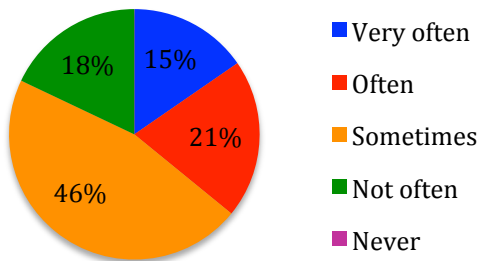


In case it happens that you change your mind, does this bother you?

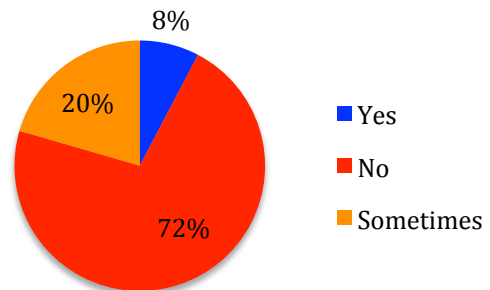


Results for the neutralisation variable from ethical consumers

How often does it happen that you change your mind about buying a product last-minute?



In case it happens that you change your mind, does this bother you?



Results for the neutralisation variable from less ethical consumers

Raw data

Question	I don't care about consuming ethically at all.	I do care about consuming ethically, but right now I lack the resources for that. (E.g. no money, time etc.)	I do care about consuming ethically. Sometimes or for some products.	I do care about consuming ethically, most of the time.	I do care about consuming ethically, all the time.	Total
How ethical would you describe yourself as a consumer?	4	9	26	18	9	66
Please select:	I strongly agree	I agree	I neither agree nor disagree	I disagree	I strongly disagree	Total
I inform myself about product(s) before I buy them	12	34	14	6	0	66
That knowledge affects my decision to buy	22	38	4	2	0	66
I care about what people who are important to me think about the product(s) I buy	8	16	20	13	9	66
I feel that I have an obligation to buy ethical products	16	26	8	11	4	65
It is easy for me to identify ethical products	5	25	15	13	8	66
I feel that I am in control of what I want to buy	17	30	14	5	0	66
Sometimes my decision to buy a certain product changes last-minute when I'm in the store	17	34	7	7	1	66

I believe that me consuming ethically will...	Very Likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely	Total
Result in more ethical products being sold in general	23	25	11	5	2	66
Encourage companies to sell ethical products	26	25	6	8	1	66
Lessen the amount of non-ethical products on the market	20	18	15	11	2	66
Result in my peace of mind	30	22	8	3	2	65
	Very often	Often	Sometimes	Not often	Never	Total
How often does it happen that you change your mind about buying a product last-minute?	8	14	31	13	0	66
	Yes	No	Sometimes	Total		
In case it happens that you change your mind, does this bother you?	8	42	16	66		
	Denial of Responsibility	Denial of injury	Denial of victim	Condemning the condemners	Appeal to higher loyalties	Total
In case it does bother you, do you find a reason for yourself to explain your decision? Please give an example(s)	8	0	0	0	0	8

Question	I don't use such a tool	I use an app	I use a website	I use product reviews from magazines	Other	Total		
Do you use any tools that help you in deciding what products you want to buy?	43	6	15	5	2	71		
	Easily Accessible	Informative (detailed information)	Personal benefit (e.g. Discount)	Crowdsourced	Fast	Ease of Use	No answer	Total
In case you do use a tool, what do you like about it?	2	11	1	1	4	2	7	28
	Search time	Amount of Information	Amount of Products	Allow data manipulation by user	Good search algorithm	Compare products	No answer	Total
In case you do use a tool, what would you like to improve?	1	2	2	2	2	2	18	28
	Useful	Neutral	Would not use it	No answer	Total			
What do you think of an app that provides you with information about the ethical issues concerning the product you want to buy?	41	4	3	18	66			
	Yes	No	Maybe	No answer	Total			
Would you use such an app?	42	15	6	3	66			
	Ethical product rating	Health impact	Production process	Detailed product information	Ethical impact	Total		
What information about products should such an app display?	5	5	22	26	27	50		
	Sharing the product	Seeing what others buy or like	Information about green energy	Information about sustainable living	Ethical recipes	Other	Total	
Should the app also enable you to get informed about more than products themselves? Please select or add something you would like to see.	19	23	29	41	27	3	57	

Please rate their importance of the following features.	Very important	Important	Neither important nor unimportant	Unimportant	Very unimportant	Total
Social aspects	16	26	9	4	4	59
Being able to see alternatives for the product you have found	34	24	2	0	0	60
Being able to see where to buy the alternatives	33	23	4	0	0	60
Information about the producer of the product	37	20	3	1	0	61
Popular products	9	15	30	2	3	59
A link to the website of the organisation behind the application for extra information	20	22	13	5	1	61
A 'Home page' displaying general information and user's activities	9	18	23	7	3	60
Adjust the importance of ethical issues (for instance, weighing social rights stronger than animal welfare)	16	27	12	3	2	60