



# Valuepack Project Report

## **Tools for Creating and Measuring the Value in Packaging**

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Authors:

Virpi Korhonen	Package Testing & Research Ltd
Satu Jokinen	Package Testing & Research Ltd
Markus Joutsela	Aalto University
Virpi Roto	Aalto University
Terhi Latvala	Luonnovarakeskus LUKE
Kaisa Savolainen	Best Before UX Research Ltd
Leo Josephy	Aalto University
Maria Kuusisto	Aalto University
Maria Helander	Aalto University
Vishnu Shreenath	Aalto University
Rikhard Hormia	Aalto University
Ida Jokela	Aalto University
Siddharth Jayaprakash	Aalto University
Yaping Chen	Aalto University
Mukundhan Kulur	Aalto University

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Ritarikatu 3 b A 2  
FIN-00170 Helsinki  
Finland

[www.ptr.fi](http://www.ptr.fi)

## Preface

The Valuepack project conducted in 2014 – 2016 was grounded on the foundations of PTR's 30-year-history in packaging research. The project was designed to bridge the gap between existing theoretical knowledge and concrete practices in measuring and creating value in packaging, especially among business decision makers.

The project was composed of five work modules providing a holistic perspective into value formation by applying theory and research methods from various fields of sciences. The aggregate knowledge of the multidisciplinary research team, in combination with international cooperation constituted a streamlined project with almost twenty case studies.

Finland is globally acknowledged for world-class design. Why shouldn't Finland also be known for world-class packaging design? We hope the results will encourage Finnish companies to stand out on the global market through user-centered and high-value packaging. As the case studies will point out, professionally designed packages create return on investment in terms of higher perceived value, and consequently, higher preference and willingness to pay.

We want to express our special thanks to Tekes and the companies participating in the project for funding and collaboration.

Helsinki, November 2016

Project coordinator Virpi Korhonen

Managing director  
Package Testing & Research Ltd





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# INTRODUCTION

## Background

Utilizing packaging in long-term product value formation requires definition of the value of packaging for both companies and their customers. Companies should be able to recognize the value that packaging creates for their customers, i.e., identifying packaging features that increase willingness to pay, or sales numbers.

Information such as this has an effect on investment decisions when companies decide on packaging reforms. Essential inputs for return on investment calculations come from estimations for product pricing and projected numbers of individual sales. Therefore, it is important that these numbers be attainable in reality, and investment decisions can be made based on accurate information.

As an investment, packaging is often smaller than other product development costs. Yet packaging is a major deal maker, or breaker, in consumer purchase decisions. Packaging should be considered as an investment in product desirability, as well as an opportunity to secure a place in the hearts and minds of consumers.

Packaging frequently acts as an integral interface for the use or consumption of a product and thus plays a significant part in the formation of product experience, especially in food. In developed markets, competition for consumer attention is fierce and consumers' purchase preferences increasingly affect the successfulness of products. From the manufacturing industry perspective, success is often dependent on how effectively products are discovered and how they succeed in serving the consumers. Power has shifted from producers to consumers, and user-centered and experiential design is becoming increasingly important in the creation of added value and competitiveness.

Packaging is the most important marketing media that generates the maximum amount of consumer interaction and develops consumer relations for fast moving consumer goods. Few other media are invited into and are present in homes, everyday life and celebrations. At its best, packaging can provide positive user experiences. User-centered packaging design can aim to evoke predetermined impressions and experiences through the design of the packaging. For instance, these could be memories of grandmother's baking, moments of luxury, or impressions of ecology, which can make users feel better through purchase decisions.

## Drivers for Packaging Design

The traditional viewpoint in packaging leads to a perspective heavily focused on the viability and technical capabilities of a business. Such a perspective directs companies to make assumptions about the market and take risks in the development of their products before launch.

In an economy driven by consumers, the traditional viewpoint of packaging is not effective either for the consumer or the business. Instead of focusing heavily on production only, effective packaging should be considered from the following three viewpoints:

1. Viability, i.e. maintainable and enabling brand development
2. Feasibility, i.e. practical and realizable
3. Desirability, i.e. enticing to consumers.

These are the three drivers in the Design Thinking approach outlined by IDEO, an award-winning global design and consulting company. The model displayed in Figure 1 first appeared in the Design Management Journal in 2002 (Weiss, L., 2002). The idea of the model is that when balanced, these three drivers create a nest of innovation to drive business.

However, for most packages this balance is skewed, leading to minimal impact on market. The majority of package renewals do not affect companies' market shares one way or the other. In other words, lack of due consideration in testing the desirability and viability of the offering before market launch has led to no better value on the investment made.

The goal is to communicate the need for a balanced product that is viable for the business, feasible for the production, and, most importantly, desirable for the consumers. As the consumers play a major role in the success of a product, and indirectly of the brand, their role in the development and testing should occur early in the development process, to reduce the risks of failure during launch.

Four of the Valuepack work modules will focus on designing or measuring desirability. The methods can be applied to help companies design packaging for an improved and successful consumer experience. In the fifth module - Package ROI - the focus will shift to consider how companies can harness the value of packaging to drive their business.



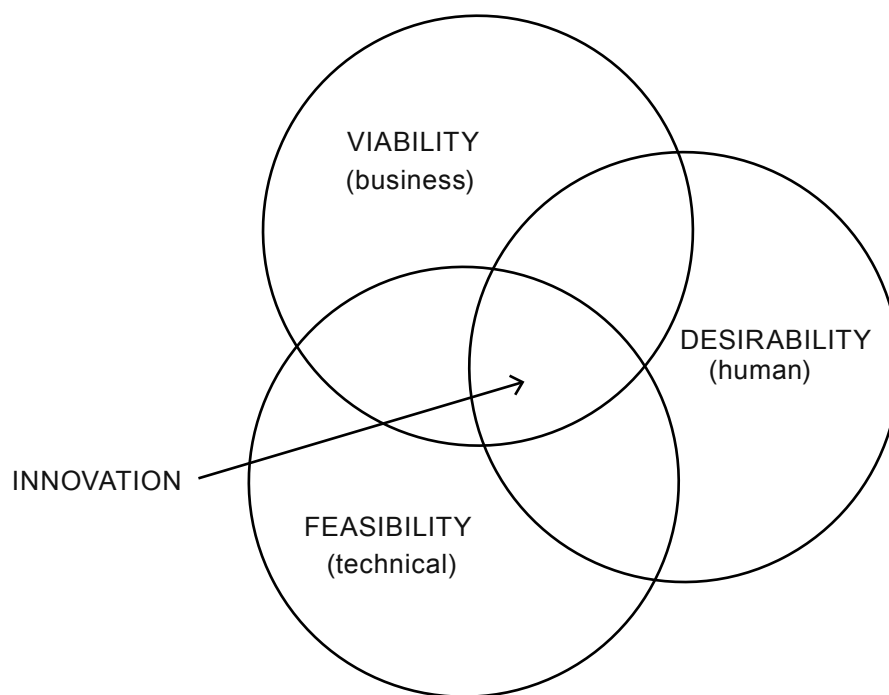


Figure 1: Adaptation of the Design Thinking model by IDEO.

## Scope of the Project

The objectives of the project were:

1. to provide companies with the understanding and tools that help create value through packaging design, and
2. to measure package value for consumers and business ROI.

The project comprised of five modules (Figure 2):

### 1. Package User Experience (PUX)

The module aimed to develop a new packaging design brief modelled in cooperation with companies. Five case products were selected to study their image, value creation and user experience. The created briefs carried targeted user experience into the packaging design process that produced packaging concepts and packaging prototypes. The five concepts were tested in other work modules of the project, and the results were compared with the initial brief objectives. The work module was carried out by Aalto University.

### 2. Package Value Toolkit (PVT)

The module aimed at developing a tool for measuring and visualizing package value for the consumers. The toolkit was developed and tested in cooperation with the participating companies in different contexts of use (benchmarking, prototyping, launch, and corporate R & D). The work module was carried out by Pakkaustutkimus – PTR; currently known as Package Testing & Research Ltd (later PTR).

### 3. Willingness to Pay (WTP)

The module aimed to develop methods for the measurement of consumer willingness to pay (WTP), to test the reliability of the WTP methods applied, and to simplify the data collection and design of the WTP studies. In this work module, the packaging concepts were studied for consumer willingness to pay by applying economic experiments based on the experimental auction method. The work module was carried out by LUKE.

### 4. Validation of eye tracking methods (EYE)

The module aimed at validating eye tracking data collected in virtual environments for physical environments. The studies were conducted both parallel to and independently of the other work modules. The work module was carried out by Best Before UX Research Ltd, a project participating start-up.

## 5. Package ROI

The module aimed at developing a method for evaluating the Return on Investment (ROI) of packaging projects. Four business cases were selected from the participating companies to develop and test the method. The work module was steered by PTR and conducted as a student project by two IDBM (International Design Business Management) teams from Aalto University.

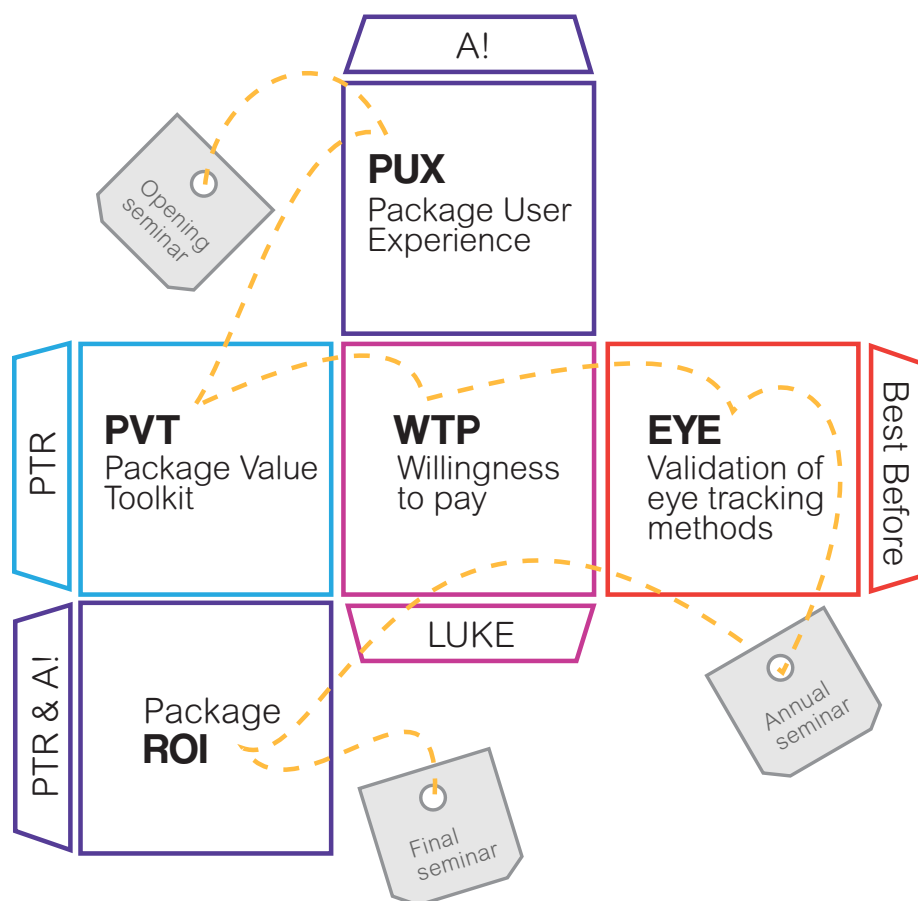


Figure 2. Valuepack work modules.



## Company Cases

Altogether 17 company cases were utilized in the course of the project which are listed in Figure 8. Five company cases were chosen to overlap the modules of the project. The packaging concepts for these cases were designed in the PUX module by students in the Pack-Age course by Aalto University.

### Case 1. Home cooked ready meal (HoviRuoka)

Design brief: Redesign of a vacuum-packed single-meal package previously consisting of a tray, plastic film and a cardboard sleeve. The packed meal was a traditional recipe and of high quality, made with non-processed ingredients and without additives. The main goal was to help the product to stand out from its competitors while reducing the plastic look of the package. As emotional goals, the packaging should communicate the home-cooked feel of the product, as well as trueness, deliciousness and reliability. The design should equally appeal to elderly people, younger single consumers, and families with young children.

Package design: The concept draws inspiration from a traditional lunch bag (Figure 3). Natural materials and minimalist visuals convey authenticity, clarity and naturalness of the product.

### Case 2. Casual chocolate gift giving (Fazer Confectionary)

Design brief: A new packaging concept for wrapped chocolates. The packaging was expected to be casual, small, and simple – but versatile enough to suit different chocolate brands for year-round casual gift giving. The target group was men and women aged 20-35. As experiential aims, the package was expected to delight and surprise, demonstrate thoughtfulness, and be perceived as special or different. Stylistically, the packaging should convey quality, yet be casual enough for modest gifting. The brand is strong, traditional, and has local market dominance in the category.

Package design: Students created a unique one-piece structure utilizing double-sided printing and an unorthodox telescopic opening mechanism (Figure 4). When opening the package, the top slides open like a camera shutter and previously hidden graphic patterns are revealed on the sides of the package.

### Case 3. E-commerce gift box (Finnish Corrugated Board Association)

Design brief: A combined delivery (transport) and gift box offering a unique personal experience, delighting and surprising the receiver. The package should be interesting, memorable, and accommodate/suit many occasions. It



Figure 3. Packaging concept for Case Hoviruoka.



Figure 4. Packaging concept for Case Fazer.



Figure 5. Packaging concept for Case Finnish Corrugated Board Association.



Figure 6. Packaging concept for Case Verman.



was expected to promote high quality and delightful functionality to its users. As functional requirements, it should be easy to open and close, as well as to reuse or recycle later. The target group was frequent users of e-commerce services in their 20s and 30s.

Package design: The students designed a package with a multi-layered structure (Figure 5). The outside is discreet in order to avoid drawing attention during delivery, but the inside is colorful. A greeting card is instantly served by a pop-up structure when the lid is opened for the first time.

#### Case 4. Vitamin supplements (Verman/Bioteekin)

Design brief: A concept for a new product range, with the possibility to create the product name and brand concept through packaging design. The design should be perceived as non-medicine looking and unique, yet fit for health-oriented consumer lifestyles.

Package design: Students created a brand called Elo (Life) and a 3D-printed packaging dispenser drawing inspiration from natural forms such as rocks, droplets and leaves (Figure 6). The dispenser is handy to carry along and offers user convenience at the point of serving.

#### Case 5. Food service packaging (Metsä Board & Epic Foods)

Design brief: A food service package for delivering meals to homes and offices needed a new, more sustainable packaging concept that would work for delivering warm and cold meals to customers. A new biodegradable material for food products was used in prototyping. The package was expected to offer a pleasant experience and convenience, but clearly differ from i.e. fast food packages.

Package design: New structures and fresh branding (Figure 7). The service-system story is communicated on the inside of the delivery bag. The slip-on lid design for the warm meals provides ease of use at the point of filling, and the concave lids of the salad packages provide convenient stackability at the point of delivery.



Figure 7. Packaging concept for Case Metsä Board & Epic Foods.

		PUX	PVT	WTP	EYE	ROI
Organizations	Products					
HoviRuoka	Ready meal	C1	C1	C1	C1	
Fazer Confectionary	Chocolates	C2	C2	C2		
Finn. Corr. Board Ass. (SAPY)	Online gifting	C3	C3	C3		C3
Verman/Bioteekin	Supplements	C4	C4			
Metsä Board & Epic Foods	Delivery meal	C5	C5			C5
Verman & Packdesign ID	Beauty Suppl.		C6			
Verman & Packdesign ID	Vitamin D		C7			
Packdesign ID	Raw sausages		C8			
Best Before UX Research	Powdered oat		C9		C9	
Fazer Confectionary	Chocolate bars				C10	
Verman	Melatonin				C11	
Pakkaustutkimus – PTR	On-the-go coffee		C12			
Pakkaustutkimus – PTR	Hummus		C13			
Pakkaustutkimus – PTR	Veg. proteins		C14			
Adara	Display				C15	
Pakkaustutkimus – PTR	Oatmeal		C16			
Stora Enso	Cold cuts		C17			C17
Elopak	Yogurt carton		C18			C18
HoviRuoka	Ready meal		C19			

Figure 8. Studied cases in the project.

## Project Participating Companies

Adara Pakkaus Oy  
Coveris Rigid Finland Oy  
Elopak Oy  
Epic Foods Oy  
Fazer Makeiset Oy  
Flexolahti Oy  
HoviRuoka Oy  
Linkit Concept Oy  
Metsä Board Oyj  
Packdesign ID Oy  
Remes & Packart Oy  
Stora Enso Oyj  
SEK Point Oy  
The Finnish Corrugated Board Association (SAPY)  
Suunnittelutoimisto mera Oy  
Tekes  
Oy Verman Ab  
Win Win Packaging Oy



# RESEARCH MODULES

## Package User Experience PUX

The Package User eXperience (PUX) module aimed at helping the companies to identify and measure packaging-related experiences, and to introduce a Design for Experience approach into the packaging design context through applying a new type of experience-driven brief.

### What & Why

The package should be seen as an investment in the desirability of the product and creating a sustaining emotional bond between the consumers and the brand. The PUX research studied packaging user experience by exploring ways to help the packaging industry to design experiences that create value for consumers.

### How

The research consisted of user research, co-design, and empirical studies along the packaging design process of five business cases. At the end, the user experiences of 3/5 cases were evaluated in a controlled experiment. The overall PUX research process is visualized in Figure 9.

Before starting the actual packaging design process, consumers from each case-specific target group participated in a survey. Information was collected about the consumers' wishes, needs, expectations and experiences related to the product and its packaging. The survey was developed in collaboration with the brand owners to ensure that enough relevant and product-specific information were gathered. The qualitative data of the survey were analyzed and visual profiles of the results were created for product based on the mean attribute scores.

In a co-design workshop with professional packaging designers, the brand owners were asked to select the three most relevant or interesting findings to define the key experience goals to be integrated into the packaging design brief. The aim of the workshop was to exchange knowledge about the best briefing practices, and to create a dialogue between the designers and brand owners about how the experience goals could be implemented in the brief.

The UX briefs were given to five multidisciplinary Pack-Age student teams. Pack-Age is an interdisciplinary 3-month packaging design course at Aalto University. During the design process, the teams were surveyed about brief comprehension and interviewed in groups about their use of the briefs, experience goals, and the kind of challenges they encountered. At the end of the course, the students presented the new packaging concepts and prototypes to the case companies and delivered a project report describing the process.

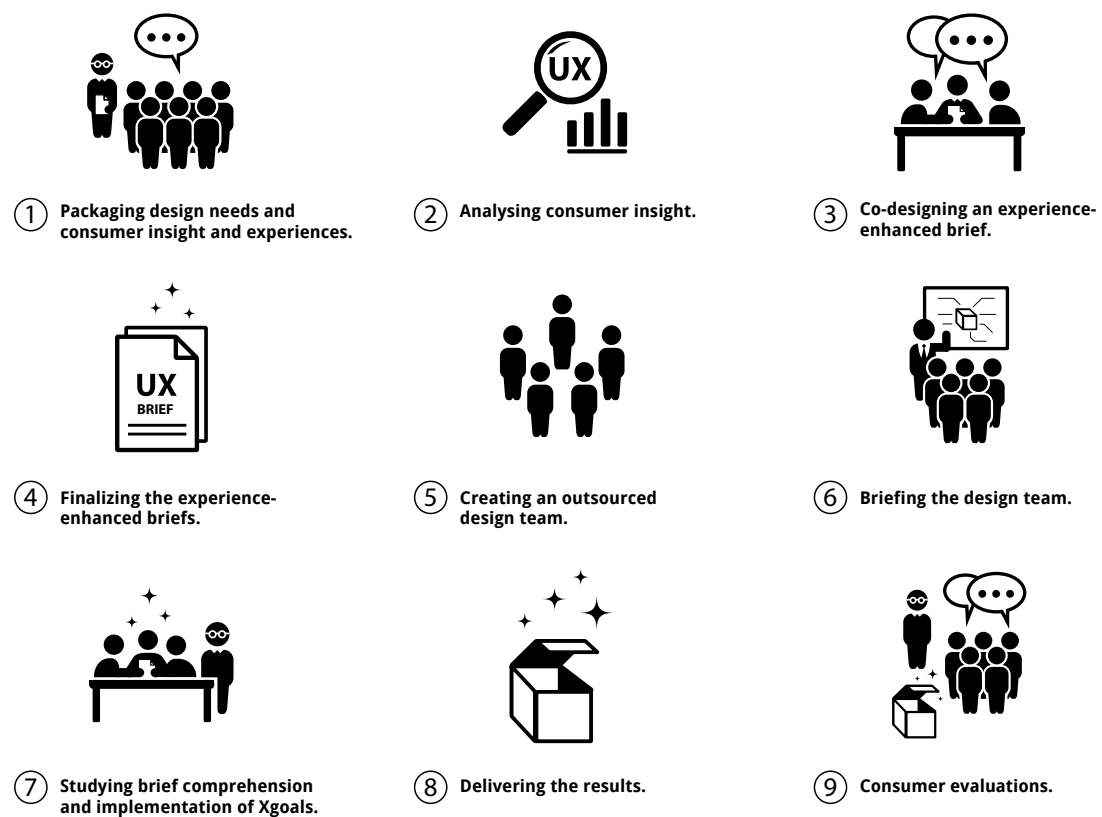


Figure 9. The PUX research process.

After the design work was completed, the prototypes were tested with the users to study whether the design was able to convey the targeted experiences to its intended audience, and to see if the actual experiences aligned with the experience goals (Xgoals) described in the briefs. Consumer studies were conducted to study packaging interaction, resulting experiences, and willingness to pay (WTP). As the e-commerce, chocolate and ready meal cases had the most production-ready prototypes, these products were selected for user testing. A marketing research agency recruited 77 participants representing the target groups of the three products, and physical mock-ups of each prototype were manufactured by a printing house.

In the evaluation, each participant interacted with the prototype and evaluated the related experiences individually on a research questionnaire. Open-ended questions were used to collect experience descriptions in the participants' own words about the first impression, visual appearance, and opening experience. The first impression and appearance related questions were asked before opening the package, so the inside of the prototype did not affect the appearance evaluations in our study. In addition, qualitative information on the ideal context of use were collected. AttrakDiff (Hassenzahl et al. 2004), Interaction Vocabulary (Lenz et al. 2013) and Brand Personality (Geuens et al. 2009) scales were used to observe how the prototypes performed in terms of some quantifiable general (not case-specific) packaging-related experiential criteria. On the survey, consumers' WTP was inquired twice - before and after package opening - to study whether the interaction experience had an effect on the willingness to pay.

## **Results & Impact**

One of the main aims of the PUX research was to develop and test an Experience Brief which would focus on the user experience. Instead of developing a specific type of an experience brief, we recommend integrating the experience goals (Xgoals) in all relevant sections of the design brief. This way, the user experience aspects are not left isolated, but gain attention in each section of the brief and thus in several aspects of the package design. The format of an Xgoal should allow expressing unique experiential qualities that have the potential to differentiate the package on the market. Existing lists and scales of brand, user, and interaction experience can help in ideating Xgoals and comparing different packages, but for the brief, a richer description of the intended experience is needed. Whatever the Xgoal description in the brief is, discussion between the client and the design team is important to establish a shared understanding of the reasons behind and the specific nuances of the Xgoals. It is beneficial, if the brief is in a flexible format to allow easy updates.



To avoid confusion, it is recommended that just a few primary Xgoals are used and the others are listed as secondary.

During the course, the student teams used various methods for developing, expanding, specifying and sharing their concept idea and its experiential aspects. Tools such as mood boards, concept maps, personas and scenarios were used to help build a shared understanding of the intended users, their values and motivations as well as the context of use.

In the evaluation (user testing) phase of the ready prototypes, the respondents spontaneously reported most of the intended experiences in replies to open-ended questions such as “How does it feel to use the package”. Therefore, we conclude that open-ended questions can be used to see whether the experiences are realized. The most demanding task is the analysis of the open-ended questions, as it requires identifying semantic similarities of the terms used. The quantitative scales used, i.e. the modified AttrakDiff, Interaction vocabulary, and Brand Personality turned out to be too generic for testing whether the intended experiences were realized.

Our study showed that the package interaction experience does have an influence on WTP. A positive interaction experience can thus provide added value that translates into a heightened WTP. The analysis on the possible reasons behind the WTP change showed that WTP decreased owing to pragmatic problems in opening the package, and increased when the design was addressing hedonic factors. Our study did not find any positive pragmatic experiences to increase WTP, but a specific analysis of the stimulating experiences (surprising, original, innovative, etc.) in all three packages showed that WTP increased significantly with positive stimulation. We conclude that also with package design, pragmatic factors seem to act as hygiene factors that remove disappointments, but it is the hedonic factors that motivate consumers to pay more.

Several academic papers have been published based on the work and they conclude the results and descriptions in more detail (Appendix B).

## Package Value Toolkit PVT

The Package Value Toolkit (PVT) work module aimed to develop a tool for identifying the packaging characteristics most critical to value formation. The result was a low-cost tool for measuring package value for consumers, pointing out pitfalls and opportunities in gaining market share/higher price, and assisting in making decisions regarding packaging investments.

### **What & Why**

The Package Value Toolkit is a versatile, low-cost, visual tool for measuring package value for consumers. It was created for incorporating customer views into packaging design processes.

Measuring package value is integral for companies striving to respond to consumers' preferences and requirements, fully benefit from packaging as part of marketing efforts, and justify investments in packaging design. Furthermore, the tool will help companies make both prompt and informed choices and decisions before investing in packaging machinery, and eventually even to become a forerunner in packaging development.

### **How**

The PVT development process (Figure 10) followed the Design Research Methodology (DRM) framework by Blessing & Chakrabarti (2009). To set the goals for the PVT, literature on customer value was reviewed and designer interviews were conducted. Based on designer insights, the requirements for the tool were described as follows:

- a. powerful, easy, and inexpensive to use,
- b. must not require a large number of respondents,
- c. general enough for evaluating a wide range of packages representing different product categories,
- d. applicable at all stages of the design process, and
- e. should render results in visual and easily interpretable form.

To collect a large and varying pool of attributes a designer workshop with 15 designers and researchers was arranged, evaluating five packaging concepts created in the PUX module. The workshop resulted in 357 unique attributes describing packaging. First, these characteristics were combined with attributes from literature and then narrowed down to 200, covering opposing pairs. Next, the attributes were assigned to one of the following four main categories: functionality, aesthetics & emotion, personality, and responsibility.

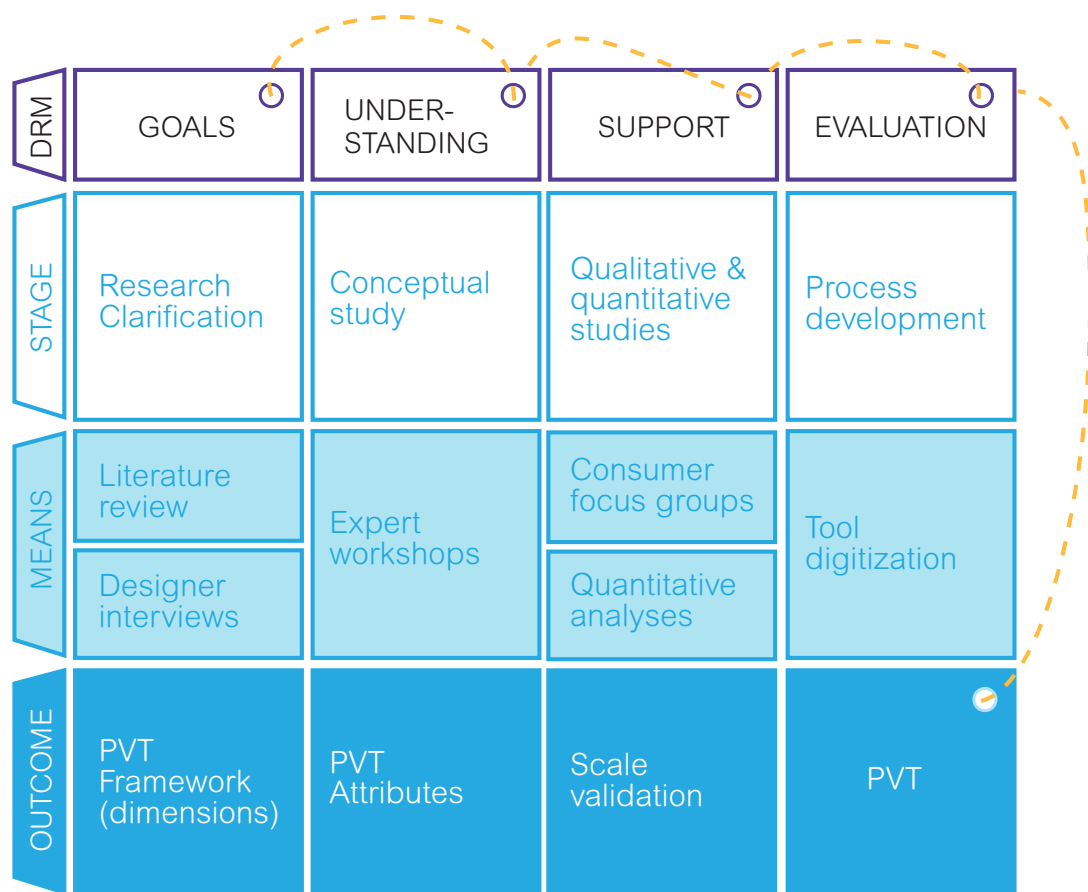


Figure 10. PVT development process.

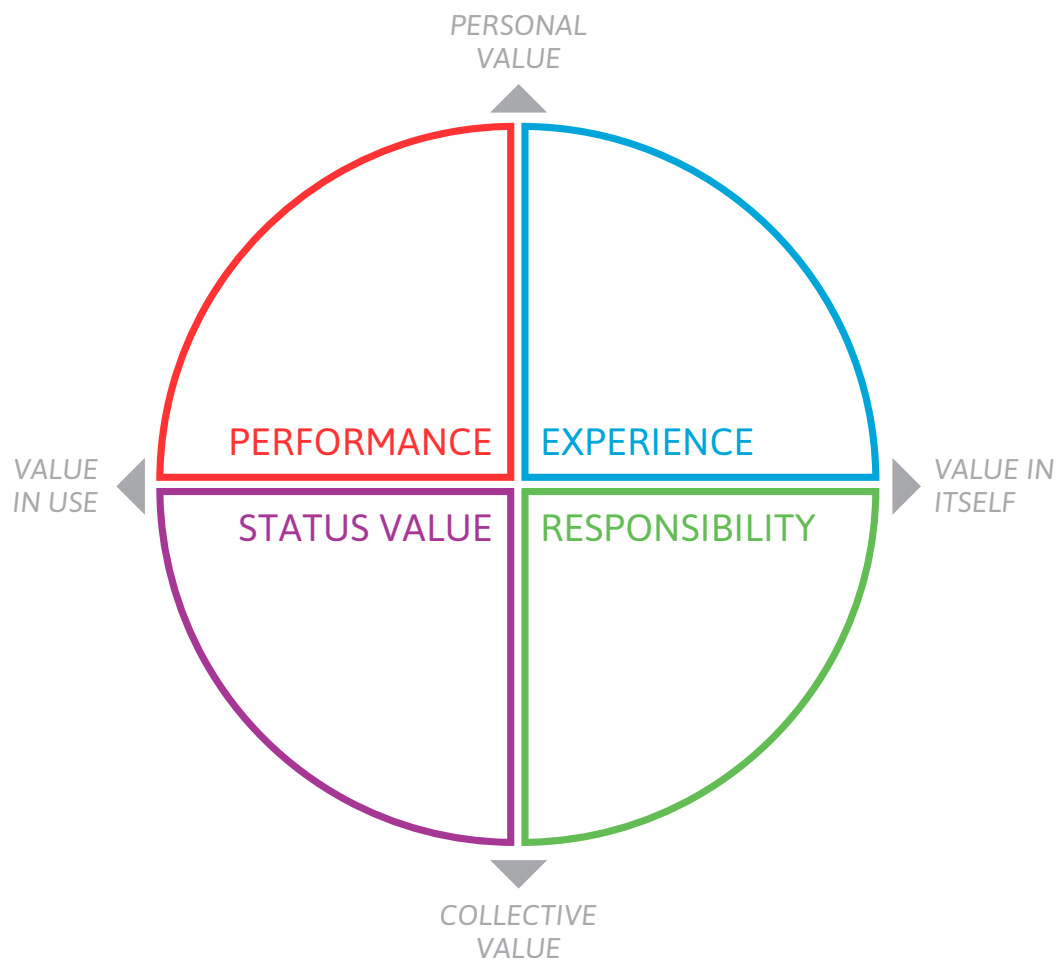


Figure 11. Value framework combined with PVT value dimensions.



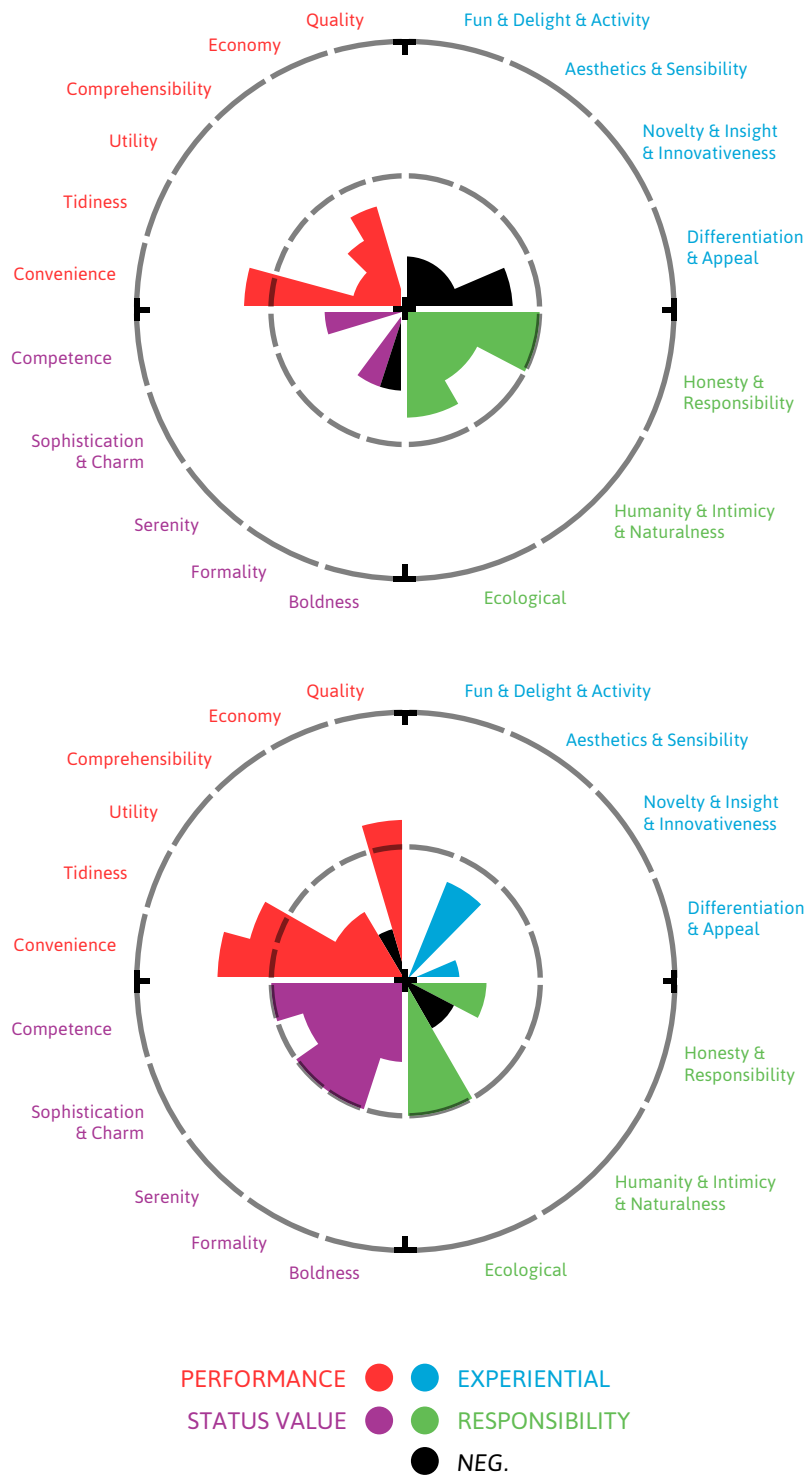


Figure 12. PVT value profiles for two comparative designs.

To develop the research tool, each attribute was displayed on a card with its opposite on the other side. The corresponding dimension for each attribute was identified with a color. In testing situations, consumers applied a set of preselected cards to describe 2-3 packaging concepts under evaluation. The percentages of the applied attributes were imported into a designed wild rose diagram to visualize the value perceived within each concept along the four dimensions and the related subdimensions.

Both qualitative and quantitative studies were applied to validate the attributes and generate the subdimensions. Again, based on the data, the number of attributes was reduced to 156, measuring 28 subdimensions. The four main dimensions were labeled as performance, experience, status value and responsibility (Figure 11).

As data collection on cards proved time consuming, a digital version of the toolkit was developed with Symbio Finland. Each of the 28 subdimensions has 3-8 attributes for the brand owners to choose from. The evaluation tool is used on tablets, while physical mock-ups are available for the participants, in order to study the value arising from both the haptic properties and usability. Within each design case, 2 to 3 comparative designs are evaluated in two focus group sessions (2 x N=6) representing the target group for the case product (Figure 12). After the evaluation, the respondents are displayed their personal value profiles for each concept to reflect upon in the discussion. The toolkit also measures preference and WTP based on both first and secondary impression, after the concept has been evaluated.

### **Results & Impact**

A total of 50 concepts evaluated with PVT have shown that it is an efficient and easy way of measuring package value for consumers. Feedback from participants has been positive as well, the cards were regarded as fun, and later the digital version was considered straightforward, fast, and easy. The digital toolkit is under development and testing, to further validate the attributes and define its user interface both for participants and back office users.

In spring 2016, PVT was entered in the Think Ink innovation competition, where it was ranked among the top eight and awarded a small grant for its digital development process. PVT was awarded the second prize in the competition in November 2016.

## Willingness to Pay WTP

The module aimed to simplify the design of WTP studies, for easier application in parallel with other research methods.

### What & Why

In order to boost the added value of a product by means of packaging, the design process requires determination of the key factors in value creation. Measuring value creation by willingness to pay (WTP) provides companies with monetary information to use in their decision making processes when bringing new or redesigned products to the market. In this project, WTP measurement was extensively connected to the parallel work modules, i.e. the user experience study with Aalto University, eye tracking study with Best Before Ltd, and package value toolkit development with PTR.

### How

WTP & PUX: In the first experiment, a non-hypothetical value elicitation method was used following the Becker–DeGroot–Marschack (BDM) procedure (Becker et al. 1964). Non-hypothetical experiments have gained popularity because they closely resemble real purchase situations by using physical products and allowing the exchange of real money. The research set-up is pictured in Figure 13. The BDM experiment was conducted to measure how the packaging experience affects WTP before and after the opening experience, with the participants reporting twice their WTP for a single unit of a specific product. The difference between the two rounds of consumer-specified WTP responses indicates how consumer perceptions of packaging and its value change as the experience accumulates, and the difference indicates whether the opening experience was positive or negative.

The three PUX designs (chocolate, ready meal, and e-commerce package) were tested by using a BDM auction with a total of 77 participants. At the beginning of the WTP experiment, the BDM procedure was explained to the participants, and the importance of expressing their true WTP was highlighted. Prior to the actual valuation task, we employed a training round for the auction mechanism and WTP by using a cookie bar as an example. After this, the participants were shown how price is determined after the auction and who will be determined as buyers during the experiment. We first tested WTP based only on an external, visual evaluation of the package (WTP1), then a second time after the respondents had experiences of using the package (WTP2). After the BDM procedure, the experimenter chose one of the participants to randomly draw a single price from a pre-determined price distribution set. Participants who expressed a WTP higher than the drawn price were included as potential buyers for the product. In each research session (with



Figure 13. Consumer research set-up for combining WTP with PUX.



Figure 14. Consumer research set-up for combining WTP with EYE.



max four participants), the highest bidder was declared the buyer, and if the bid was higher than the randomly drawn price, they bought the product at the price equal to the randomly drawn price. One product prototype was set for sale in every session.

**WTP & EYE:** It is highly recognized that hypothetical food choices might suffer from hypothetical bias. This refers to the fact that subjects facing a hypothetical buying decision tend to behave differently from subjects in a real buying situation. While the issue of hypothetical bias has been investigated in terms of WTP, no study has investigated it with respect to visual attention during food choice.

The WTP measurement was combined with eye tracking to investigate whether visual attention differs when conducting a hypothetical versus non-hypothetical food choice study in eye tracking. Visual attention has two measures:

1. visual count, i.e. number of (gaze) fixations on the areas of interest, and
2. fixation time, i.e. duration of (gaze) fixations on the areas of interest.

Visual attention was measured during the choice experiments in two different treatments: hypothetical and non-hypothetical. In the non-hypothetical treatment, one package choice set is randomly selected as binding. The objective of this study is to assess and compare visual attention for the various attributes across the two treatments. Thus, the study investigated the sensitivity of visual attention based on hypothetical versus non-hypothetical choice experiments. A total of 185 consumers were tested, of which 93 participated in the hypothetical experiment, and 92 participants in the non-hypothetical experiment. The experiments were run on both a small computer screen and a large wall screen, to test for data differences between screen options (Figure 14).

**WTP & PVT:** The WTP was also combined with the Package Value Toolkit (PVT). Within each case study, a two-step WTP question was applied. The first question was posed based on first impression, i.e. the visual appearance of the package. The last WTP was based on second impression, after the respondents had more experience of using the package. In some cases, non-hypothetical WTP was also applied, i.e. the participants were given an opportunity to draw one of the evaluated products and buy it for a price drawn among the bids for that specific product.

## **Results & Impact**

WTP & PUX: The average increase in the WTP was €0.56 (0.61 USD), which means that on average, the effect of using the package resulted in an increased WTP. There was an increase in WTP for 57% of the respondents, no change in WTP for 29% of the respondents, and decreased WTP for 14% of the respondents. The opening experience of the e-commerce package had the strongest positive effect (+€1.34) when measured with change in WTP, followed by the chocolate package (+€0.32). The ready meal package had the smallest change in WTP (+€0.18).

For some participants, experiences of the package opening yielded a rather high WTP score. These participants described their experience as "a positive surprise", and the package design was described as 'innovative' and 'very special'. Reasons for diminishing WTP emerged mainly if a respondent, after experiencing the surprise element, started to consider the functionality of the package, for example, if they encountered difficulties opening the package or taking the product out of the package. One of the evaluated products (the ready meal) had an inner package that wrapped the food ingredients tightly on the plastic serving plate. This plastic-look experience led to some negative evaluations for the product itself and resulted in negative WTP.

WTP & EYE: The results can be compressed in three observations regarding visual attention featured in Figure 15.

WTP & PVT: A total of 50 packaging concepts were tested for WTP before and after each Package Value Toolkit evaluation. The change in WTP was negative for 58 %, neutral for 12%, and positive for 30% of the tested concepts. The full data will be further analyzed and reported with regard to the major dimensions and subdimensions of the toolkit.

RELATIONS	OBSERVATIONS
The hypothetical nature and visual attention/attendance	No differences were observed between the hypothetical and non-hypothetical WTP in terms of visual attention (fixation count and fixation duration). The results also indicated no differences between the results of the data from computer screen testing and large screen testing.
Stated attribute ignorance and visual attention/attendance	Those who stated to have ignored an attribute had, on average, lower visual attention scores for the attribute (fixation count, fixation time) and more choice tasks (out of 8) in which they visually ignored that attribute.
Visual attention and choice behavior	For the origin label (Finnish origin), a higher visual attention score was related to higher preference.

Figure 15. Observations on visual attention (result of combining WTP with EYE).

## Validation of Eye Tracking Methods EYE

Several eye tracking studies were conducted parallel to the PVT and WTP work modules. The purpose of the studies was to validate different data collection methods and environments for eye tracking (physical and virtual store in two different display sizes). For WTP, eye tracking was applied in order to see which elements of the packages capture attention when evaluating the package for willingness to pay. In addition, some project partners' packages were studied with eye tracking in virtual environments.

### **What & Why**

Eye tracking studies how fast different packages are noticed, which packages are noticed first, and which ones gain the most attention. In this way, eye tracking makes it possible to evaluate package designs from a visual attractiveness point-of-view. The eye tracking equipment used in this project included Tobii Pro Glasses 2 (a head-mounted eye tracker), a Tobii X60 eye tracker (a remote eye tracker) and a Tobii pro X2-60 eye tracker (a remote eye tracker).

### **How**

The studies in a physical environment were conducted at the K-Citymarket Malmi, Helsinki. The same environment was virtualized for the virtual environment studies. The studied product categories included ready meals and chocolates, and some displays were tested in the bakery department. In addition to these, packages of melatonin products were studied on the shelf of a virtual pharmacy.

The ready meal case was conducted as a redesign case. The existing package was compared to the redesigned package to provide insights into which package gained more visual attention. The chocolate case was also a redesign case: the performance of both the current and new designs was measured. The melatonin study provided insights into how different melatonin products were categorized based on different criteria and which package elements attracted attention in terms of each criterion. The display case in the bakery department provided insights into the attention gained by each display design.

Participants were recruited both via telephone interviews and at the shopping mall. The total sample size was 180 participants. The main selection criteria were that the participants bought ready meals at least once a week, had normal vision with or without glasses or contact lenses, and no history of eye diseases. The participants were randomly assigned to one of the three groups based on the research environment; the physical store (N=60), virtual environ-

ment projected onto the big screen (N=60), or virtual environment on a laptop (N=60). As the experiment had a package re-design objective, each participant was exposed to one of two different types of packages from one brand owner. In each environment, 30 participants were exposed to the old package design, and 30 participants to the new package design.

#### Physical Environment

After the testing equipment was set up and instructions were issued, the participant walked down the aisle to a marked spot, to gaze at the ready meal shelf. No time limit was set for making the choice. Having chosen the product, the participant placed it in the shopping basket.

#### Virtual environment

The study in the virtual environment was similar for both set-ups (a 144" screen and a 17" display). The virtual environment study was conducted with the rest of the studies in November 2015. They were redone in July 2016, as the test set-up was slightly different from the physical environment. In the virtual tests, the participants first saw an approach video that led them to the shelf, and were then shown a written task. After this, they viewed a picture of the virtual shelf and made their selection.

#### Results & Impact

The results provided valuable insights that will support package design. After redoing the virtual part of the study, the results from the virtual environment were also more relevant and some correlation between the different environments could be found. The study pointed out quite clearly which packages stand out first from the shelf and which gain more attention. This information is essential when designing successful packages for the market. Eye tracking works best when evaluating different package designs or testing existing packages in competitive environments. The advantage of conducting eye tracking in virtual environments is that there is no need to manufacture physical mock-ups of the packages, resulting in extensive savings in both time and expenses.



## Package ROI

The aim of the final Valuepack work module was to develop a framework for evaluating return on investments (ROI) for packages. The framework was built in collaboration with the IDBM program at Aalto University and tested in four case studies provided by the partner companies.

### **What & Why**

The aim was to empower companies to consider maximizing the returns on their investments instead of focusing on costs. It was also an important aim to highlight the significance of the methods developed in the project. This required enabling strategic consideration over the entire packaging development process. A visualization was created to provide a holistic overview of the packaging value chain and the drivers for the design of packaging. A listing of methods and metrics that can be used to calculate ROI was also compiled and linked to the framework visualization.

### **How**

Two groups of students (8 in all) from the IDBM program at Aalto University teamed up to tackle this challenge. For a project with such a wide scope, they applied a multidisciplinary approach mixing design thinking with strategic and user-centered design principles.

The students followed an iterative process where theoretical work interplayed with continuous prototyping, testing, and validation through collaborative workshops and interviews with packaging industry professionals (Figure 16). The data collected was analyzed in an abductive manner, constantly moving between theory and the collected data.

The first phase consisted of a research and literature review focusing on the packaging industry and its challenges both globally as well as more specifically in Finland, followed by validation in an ideation workshop with packaging industry professionals. During the second phase of the project, the initial visualization was tested and developed based on insights provided by industry experts in Finland, Japan and USA. Using the interview findings, the framework was continuously iterated and revised with the help of drawings, paper prototypes and brainstorming sessions.

Finally, in the third phase of the project, the logic of the content was tested on cases. In addition, a second workshop with the potential end users of the tool was organized. Based on an abductive analysis of the data gathered at the workshop, the framework visualization was revised and the second and final version was created.

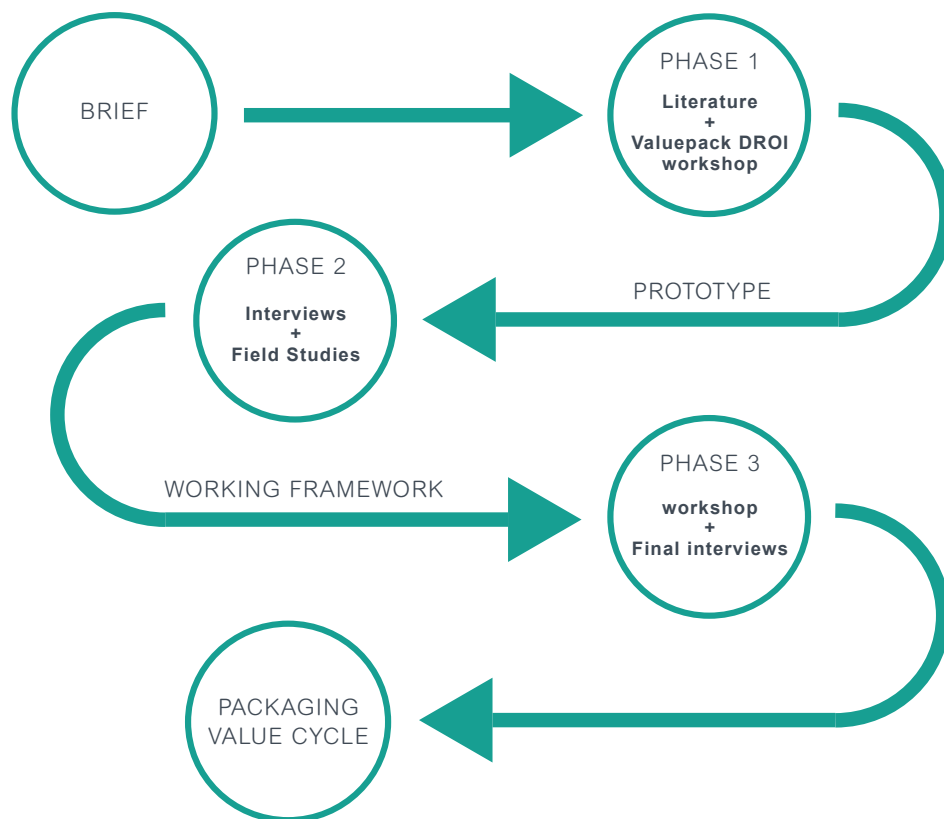


Figure 16. Package ROI module's process.

## **Results & Impact**

The Packaging Value Cycle pictured in Figure 17 provides a holistic view on the sources of investments and returns in the packaging development. Targeting the business owners, it educates the user to see the whole lifecycle and the entities involved in it. It comprises two elements: first, a visual infographic that provides an overview of the functions of packaging and the stakeholders involved in its creation; and second, a list of the functional attributes of packaging accompanied by methods for their quantification.

The framework contains three levels of logic. The levels are listed in Table 1, starting from the external/outermost level. The result is that different perspectives are included in one visualization that all parties can understand. We can see that consumers, for example, are interested in usability and experience, but not logistics or production. However, a package must meet both functions in order to be successful. By providing a method of understanding packaging from the perspectives of all its different functions and roles, it becomes easier to evaluate the related investments and returns on investment.

This cycle enables all participants in the packaging development to see all functions, operations and roles required by the packaging, hence facilitating the development of a holistic solution. The visualization promotes easier communication and collaboration amongst the packaging industry stakeholders. It also presents making estimations on returns and considering consumer responses as stages equally important to calculating investments.

The business owners benefit from gaining insights into the various operations involved, and enhancing their collaboration and communication with other stakeholders. The cycle enables evaluation of investments required and estimation of the returns obtained, helping in reducing assumptions and making informed decisions.

Table 1. Logic of the Packaging Value Cycle.

	IMPACT	DESCRIPTION
1	WHY is packaging important?	Describes the drivers/forces that influence packaging development
2	WHAT are the roles of packaging?	Functional attributes of packaging that combine the forces influencing it. Builds on information from previous level
3	WHAT are the functions of packaging?	Functional attributes of packaging
4	HOW is packaging made? WHO are involved?	From the center, the visualization shows the development of the package and the various stakeholders involved, gives a unified picture of the stakeholders and the lifecycle of the package

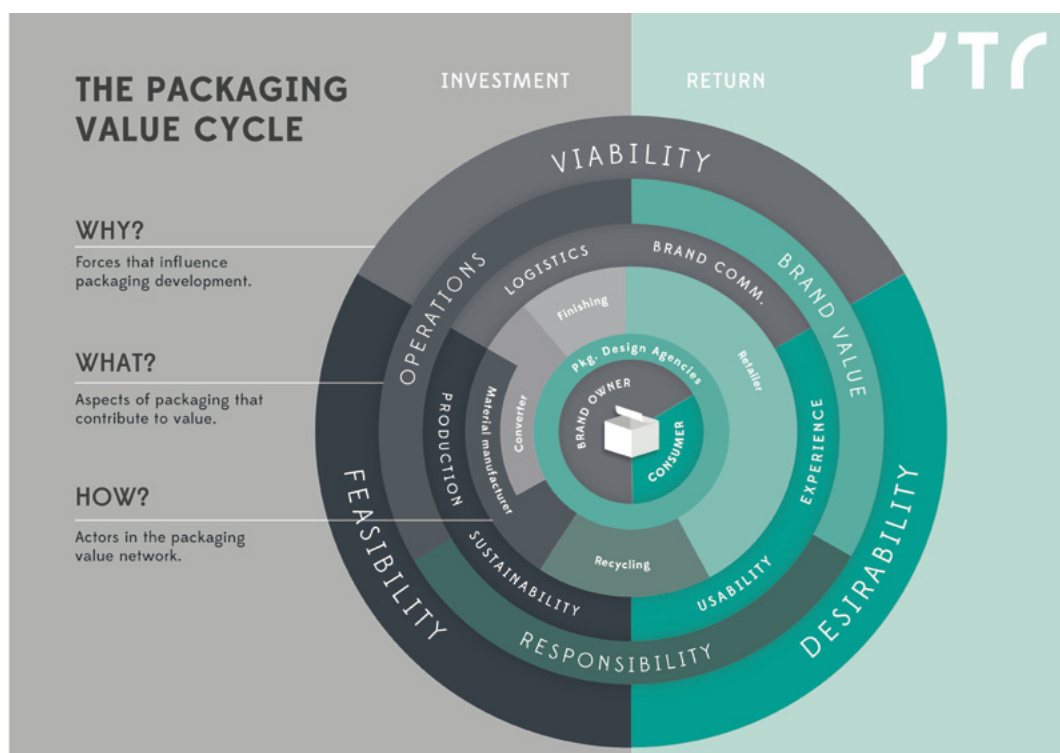


Figure 17. Packaging Value Cycle.



## CONCLUSIONS & RECOMMENDATIONS

Delivering value through packaging is crucial for gaining return on packaging investments. The aim of the Valuepack project was to aid companies to beat the challenges in importing market knowledge into creating concrete benefits for customers. The project delivered easy-to-use methods and tools for measuring value in packaging. The project also succeeded in visualizing the relationship between packaging ROI and the most relevant metrics and research methods.

The project pointed out that the value of packaging is always determined by the end user, and not by the manufacturer, designer, or brand owner. If benefits cannot be realized, no value will be gained. Unseen packaging will not sell, and if the product does not sell, the investment is lost. These facts apply to entire packaging systems, as secondary and display packaging play an important role in retail environments. In addition to physical shopping environments, future packaging needs to perform on global multi-channel markets. Online shopping opens the world from the living room couch. As the performance and responsibility of packaging is taken for granted, competitive advantage will arise from other sources of value, such as experiences and status delivered.

Within the case studies, a relationship was found between positive packaging experiences and added value that also translated into a heightened willingness to pay. The overall value of packaging will gain importance in the future, as the switching costs (i.e. costs for changing brand or product) for the online shoppers are fairly low. Poor packaging will result in mistrust and annoyance, while positive experiences serve as a source of commitment.

The Packaging Value Cycle can be utilized for importing consumer and market data to packaging development projects. The framework will aid companies to understand the importance of packaging testing for visibility, user experience and value, generating notions on pricing, and considering the end-user during the design process and across the supply chain.

Our hope is that the outputs of the Valuepack project will function as a conversation starter for the industry. The discussion on how to move on from minimizing costs to maximizing returns is vital for the success of businesses across the value chain.

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## APPENDIX A

### Steering Group

Tiia Tuominen/Juha Soini  
 Kai Tornikoski/Kaisa Savolainen  
 Timo Nurmi/Juhani Karhunen  
 Juha Oksanen/Marja Päivärinne  
 Martti Paatela  
 Hanna Lehtonen/Noora Hiltula  
 Pekka Kaikkonen/Jari Liukkonen  
 Leena Kauppi/Jenni Hietaranta  
 Lauri Järvinen/Tuula Kerckänen  
 Samuli Lyly-Yrjänäinen/Kati Murto  
 Maija Olkkonen-Seppo/Emma Kosonen  
 Riitta Halonen/Marika Perätalo/Iina Havo  
 Helena Piippo/Teemu Kurko  
 Mari Hiltunen/Juha Maijala  
 Eija Jokela/Juha-Pekka Salmi

Mari Laesterä/Maarit Rautio  
 Pirjo Hakanpää/Anna Alasmaa  
 Renne Angelvuo/Lotta Angelvuo  
 Markus Joutsela  
 Virpi Roto  
 Terhi Latvala  
 Virpi Korhonen  
 Satu Jokinen

Specialist:  
 Outi Uusitalo

Adara Pakkaus Oy  
 Best Before UX Research Oy  
 Coveris Rigid Finland Oy  
 Elopak Oy  
 Epic Foods Oy  
 Fazer Makeiset Oy  
 HoviRuoka Oy  
 Linkit Concept Oy  
 Metsä Board Oyj  
 Oy Verman Ab  
 Packdesign ID Oy  
 Remes & Packart Oy  
 SEK Point Oy  
 Stora Enso Oyj  
 Suomen Aaltopahviihdistys ry/  
 Suomen Kuitukierrätys Oy  
 Suunnittelutoimisto Mera Oy  
 Tekes  
 Win Win Packaging Oy  
 Aalto University  
 Aalto University  
 Luonnonvarakeskus  
 Package Testing & Research Ltd  
 Package Testing & Research Ltd

Jyväskylän yliopiston kauppa-  
 korkeakoulu

### Researchers in PVT

#### Principal

Virpi Korhonen

Managing Director  
 Package Testing & Research Ltd

Satu Jokinen

Design Manager  
 Package Testing & Research Ltd

#### Assisting

Elli Nousiainen

Trainee  
 Pakkaustutkimus – PTR ry

## Researchers in PUX

Markus Joutsela

Researcher / Lecturer  
Department of Media  
Aalto University

Virpi Roto

Research Fellow  
Department of Design  
Aalto University

### **Pack-Age student teams**

Case Fazer: Petriina Piihola, Heli Juuti, Oona Casalegno, Rodrigo Prieto Padila, Anu Penttinen, Janika Haataja.

Case HoviRuoka: Mukundhan Kulur, Essi Huotari, Karoliina Heikkinen, Du Yuexin, Anna-Miia Suominen, Jenna Virrankari.

Case SAPY: Anna Anc Ciechanowicz, Eriko Ishii, Sara Ceccherini, An-Ting, Din, Terhi Isokuortti, Tatu Laakso CaseBioteekin (Verman): Mirka Kolehmainen, Ho Ming Lam, Veera Kolehmainen, Yanan Li, Tuukka Pykäläinen, Kira Piipponen.

Case Metsä Board & Epic Foods: Lundell Laura, Henri Judin, Karolina Konieczna, Hengjia E, Roosa Melentjeff, Annukka Reinman.

### **Pack-Age Teacher in charge**

Markus Joutsela

Aalto University

## Researchers in WTP

Terhi Latvala

Dr. (Agric. Econ), Principal Research  
Scientist  
Luonnonvarakeskus LUKE

Ellen J. Van Loo

Dr. (Agric. Econ)  
Department of Agricultural Economics  
Ghent University, Belgium

Rodolfo M. Nayga Jr

Professor and Tyson Chair in Food  
Policy Economics  
Department of Agricultural Economics  
and Agribusiness  
University of Arkansas, U.S.A.

## Researchers in EYE

### Principal

Johanna Hänninen

Business Development Manager  
Best Before UX Research Ltd

Kaisa Savolainen

Research Manager  
Best Before UX Research Ltd

### Assisting

Antti Orava

Researcher  
Best Before UX Research Ltd

## Researchers in Package ROI

### Supervisor

Satu Jokinen

Design Manager  
Package Testing & Research Ltd

Kirsi Polvinen

M.Sc. (Biochem), Project Manager  
Innovation Management Institute  
Aalto University

Markku Salimäki

Dr.Sc. (Econ), M.Sc. (Eng), Professor  
of Practice, Director  
International Design Business  
Management  
Aalto University

### IDBM Team Pack Icon

Maria Kuusisto, Leo Josehpy, Vishnu Shreenath, Maria Helander

### IDBM Team Packaging Real Business Value

Ida Jokela, Rikhard Hormia, Siddarth Jayaprakash, Yaping Chen

### Assisting teams

Mukundhan Kulur

IDBM Student  
Aalto University

## APPENDIX B

### Scientific Articles & Publications

Joutsela, M., Roto, V. (2016), Introducing Experience Goals into Packaging Design. Design Research Society 50th anniversary conference, Brighton, UK.

Joutsela, M., Latvala, T. & Roto, V. (2016), Influence of Packaging Interaction Experience on Willingness to Pay. Packaging Technology and Science. DOI: 10.1002/pts. 2236.

Latvala, T., Korhonen, V., Hänninen, J. Van Loo, E. & Nayaga, R. Jr. (2016). Combining Eye Tracking with Economic Experiments to Measure Willingness to pay - Case: Packaging Redesign for a Ready Meal. Proceedings of the 20th IAPRI World Conference on Packaging. Campinas, Brazil.

Orava, A., Hänninen, J., Korhonen, V., Savolainen, K. & Jokinen, S. (2016). Advantages and Challenges of Conducting Eye Tracking Studies in Physical and Virtual Environments - Case: Packaging Redesign for a Ready Meal. Proceedings of the 20th IAPRI World Conference on Packaging. Campinas, Brazil.

Roto, V., Joutsela, M. & Nuutinen, M. (2016), Brand Experience Design in Multiple Touchpoints, NordiCHI'16, Workshop Proceedings of Experience Design for Multiple Customer Touchpoints.

### Posters

Joutsela, M., Roto V., Korhonen V., Jokinen S. (2015) eXperience-driven package design. 27th IAPRI Packaging Symposium, Valencia, Spain.

### Professional & Popular Publications

Joutsela, M., Roto, V. (2016) Pakkaussuunnittelulla elämyksellisiä pakkauksia. Kehittyvä Elintarvike 4/2016, p.39.

Joutsela, M. (2016) Pakkaus on hiljainen myyntimies – mutta parhaimmillaan elämys Pakkaus 2/2016, p.16-19.



## Professional & Popular Publications

Joutsela, M. (2016) Packaging as the gatekeeper. Good News from Finland. 7 Apr 2016. <http://www.goodnewsfinland.com/opinion/packaging-as-the-gatekeeper/>

Joutsela M. (2015) Kokonaisvaltaisia ratkaisuja etsimässä. Grafiikka 3/2015, p. 20-21.

Joutsela, M. (2015) Uusin aalto pakkaussuunnittelussa esittäytyi. Pakkaus 4/2015, p.12.

Korhonen, V. (2016) Uusi työkalu pakkaustestaukseen. Kehittyvä Elintarvike 4/2016, p. 35.

## APPENDIX C

### Presentations

Joutsela, M., Latvala, T. & Roto, V. (2016), Influence of Packaging Interaction Experience on Willingness to Pay. 20th IAPRI World Conference on Packaging. Campinas, Brazil.

Joutsela, M. (2016) Kuluttaja ja ekologinen pakkaussuunnittelu. Pakkausalalan ympäristökonferenssi. 28.9., Messukeskus, Helsinki.

Korhonen, V. (2014) Kohti kokeilukulttuuria - uusia työkaluja pakkaustutkimukseen. 19.11. Empack, Messukeskus, Helsinki.

Korhonen, V. (2016) Delving into eye-tracking technologies to review the benefits of recording unconscious shopper behaviours. Executing Shopping Insights. February 11th, London.

Korhonen, V. (2016) Measuring package value for the consumer - demonstration of the Package Value Toolkit. Packaging Touchpoint June 7th, Drupa, Dusseldorf, Germany.

Korhonen, V. (2016) From Cost Savings to Value Creation – an Introduction to the Package Value Toolkit. Packaging Touchpoint June 8th, Drupa, Dusseldorf, Germany.

Korhonen, V. (2016) Maksimoi pakkauksesi arvo. Package Value Toolkit – työkalun esittely. Pac Tec 20.9., Messukeskus, Helsinki.

Savolainen, K. & Korhonen, V. (2016) Mikä ohjaa ostopäätöstä myymälässä? Pac Tec 22.9., Messukeskus, Helsinki.

## APPENDIX D

### Valuepack Opening Seminar 31.10.2014

Welcome to:

# VALUEPACK SEMINAR

**31 October 2014 9:30–12:30**



- 9:30 Morning coffee & welcome words
- 10:15 **Dressing up the package**  
Pablo Steffa, Agent Pekka
- 11:00 **Experience design and aesthetics of interaction in packaging design**  
Eva Lenz, Folkwang University
- 11:45 **How to figure out the unconscious shopper with eye tracking**  
Anne Jansen & Martin Norrefeldt, Tobii

Venue: **AALTO DESIGN FACTORY** / Stage, Betonimiehenkuja 5C, Espoo



# Valuepack Annual Seminar 20.11.2015



## Annual Seminar 2015

We welcome Rob Vermeulen of ORV Consultancy B.W. as our keynote speaker. He will share his observations on packaging design with the title:

Best of Both Worlds – Design and Its Value in Europe and Asia.

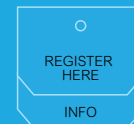
After the keynote we present the status of ongoing research tracks in Valuepack research project. Welcome to join us!



Friday 20.11.2015 8:30 -12:00

Aalto Design Factory  
Betonimiehenkuja 5, Espoo

Registration closes on Friday 13.11.2015 or when full  
Free admission, registration required, limited intake



## Valuepack Closing Seminar 30.11.2016

Seminar will be held at Wrap it! Packaging Summit in Lahti.

13:00 Packaging Value Cycle – tavoitteellisuutta pakkausinvestointeihin  
Pakkausasiantuntija Satu Jokinen, Package Testing & Research

13:20 Kokemustavoitteet pakkaussuunnittelun ajureina  
Visuaalisen viestinnän muotoilun lehtori / Muotoilun tutkija Markus Joutsela,  
Aalto-yliopisto

13:40 Hyllynlämmittäjästä markkinajohtajaksi – silmänliiketutkimus kauppa- ja  
virtuaaliympäristöissä  
Research Manager Kaisa Savolainen & Business Development Manager  
Johanna Hänninen, Best Before UX Research

14:00 Kohti nopeiden kokeilujen kulttuuria - Package Value Toolkit kuluttaja-  
tutkimuksessa  
Toimitusjohtaja Virpi Korhonen, Package Testing & Research

14:20 Mikä saa maksaa? Kuluttajien maksuhalukkuuden mittaaminen  
pakkaustutkimuksissa  
MMT, erikoistutkija Terhi Latvala, Luke

# APPENDIX E

## Methods & Metrics Listing

		Attribute:	Metrics:
FEASIBILITY	 Feasibility in production	Production cost & efficiency	Runability   Productivity   Fit in current production lines   Material wastage   Manufacturing line investment and longevity
		Packaging cost & efficiency	Packing   Package-product fit   Fit in current packing lines
		Scalability	Time to produce   Production volume
		Material properties	Material cost   Durability & quality   Printability
	 Sustainability	Material properties	Eco Labels   Ethical and renewable sourcing   Amount of recycled   Post-consumer content   Reduce amount of hazardous substances
		Lifecycle impacts	Recycling costs   Energy use   Recoverable Recyclable or reusable   Limit size and weight
VIABILITY	 Logistic efficiency	Shipping efficiency	Shipping cost   Package weight   Pallet optimization   Package size
		Product protection	Package Strength   Number of damaged packages
		Ease of handling	Clear markings   Ergonomics
	 Brand communication	Brand differentiation	AB-testing   Eye tracking   Market share
		Targeting	Market analysis   Target group studies   Access to new markets
		Quality brand message content	Consumer surveys   Willingness to pay
DESIRABILITY	 Experience	Perceived/Exceeded expectations	Package value toolkit   Eye tracking   User surveys & research   Rate of Sharing   Psycho-physiological measurements   Ethnographic studies
		Hedonic motivation	
		Cultural perception	
	 Usability	Ease of use	Customer Service Requests   User Surveys + Research   Package value toolkit   Amount of packages recycled
		Informative	
		Safe	
		Ergonomics	