

A checklist for Kansei Assessment of Food Packages

Alexander Radoslavov¹, Alexander Nikov²

Abstract: A checklist for Kansei assessment of packages in food industry is created. It measures customer feelings while observing and using a food package. The checklist includes design elements like basic and complimentary colors, form, font, logo, size, image, structure of the package. It enables the allocation of emotive design-oriented problems and thus defining relevant package design recommendations. Significant improvement of emotional customer experience with the packages is expected after implementation of design recommendations. The advantages of the checklist are: (1) measuring of emotional responses of food package customers, (2) allocation of emotive problems, (3) defining of recommendations for Kansei design of food packages.

Index Terms: Kansei engineering, food packages, assessment, checklist, emotive design.

JEL: C83

I. INTRODUCTION

Emotions, feelings and impressions of a product are important for the decision of purchasing it or not. The design of attractive packages requires knowledge about the feelings and impressions the package evokes on the customer. Integrating of these affective aspects in package design requires the introduction of suitable methods into companies' package design processes, which can capture and convert subjective and even unconscious feelings about a package into specific design elements (Desmet & Hekkert, 2002; Desmet, 2005; Garrett, 2010; Norman, 2007).

A methodology supporting emotive design is Kansei Engineering (Nagamachi, 2002; Marco Almagro & Tort-Martorell, 2012; Nagamachi, Tachikawa, Imanishi, Ishizawa, & Yano, 2008; Schütte, 2005). Kansei presents a collective semantic concept when someone gets the impression of a certain artifact from the environment or situation using his/her senses: sight, hearing, feeling, smell, taste, and their recognition. It translates consumer emotions, feelings and impressions into specific design elements of the product. Companies like Toyota, Volvo, Saab, and Scania in cooperation with the universities have successfully applied Kansei engineering methodology in their products (Nagamachi, 2008), (Chang, Chiung-Pei, & Min-Yuan, 2013; Lee, Harada, & Stappers, 2002).

There is a lack of research on applying Kansei engineering for package design. In the area of package design there are few publications, e.g. dealing with class "soft" packages, with class "hard" packages and class "semi" packages (Barnes, Childs, Henson, & Lillford, 2008; Berger, 2002; Chiu & Ho, 2013; Huang & Guan, 2009; Schütte, 2005; Schütte, 2013).

The aim of this paper is to present a checklist measuring the emotional impact of food packages on the users and customers. It can identify and grasp those affective values and translate them into specific design solutions for food packages.

II. CHECKLIST DESCRIPTION

A checklist for Kansei assessment from customer viewpoint of packages for food industry for the class "semi", i.e. made of sheet material, such as cardboard, corrugated board, PVC (Berger, 2002; Barnes et al., 2008) is proposed.

The steps for Kansei assessment of food packages are presented on Fig. 1. At step 1 the packages are assessed from visual viewpoint using Kansei word pairs (Kanamori, Imai, & Takeno, 2005). The customer estimates the values of package design elements according to his/her personal preferences/opinion at step 2. At step 3 the package is assessed after touching/using it. At step 4 an aggregated assessment of the packages is performed and relevant (if any) emotional user experience problems are allocated. During steps 1-3 the customers are not allowed to comment and discuss their emotions and feelings for avoiding distortion of individual perceptions, which are of key importance for reliable ratings.

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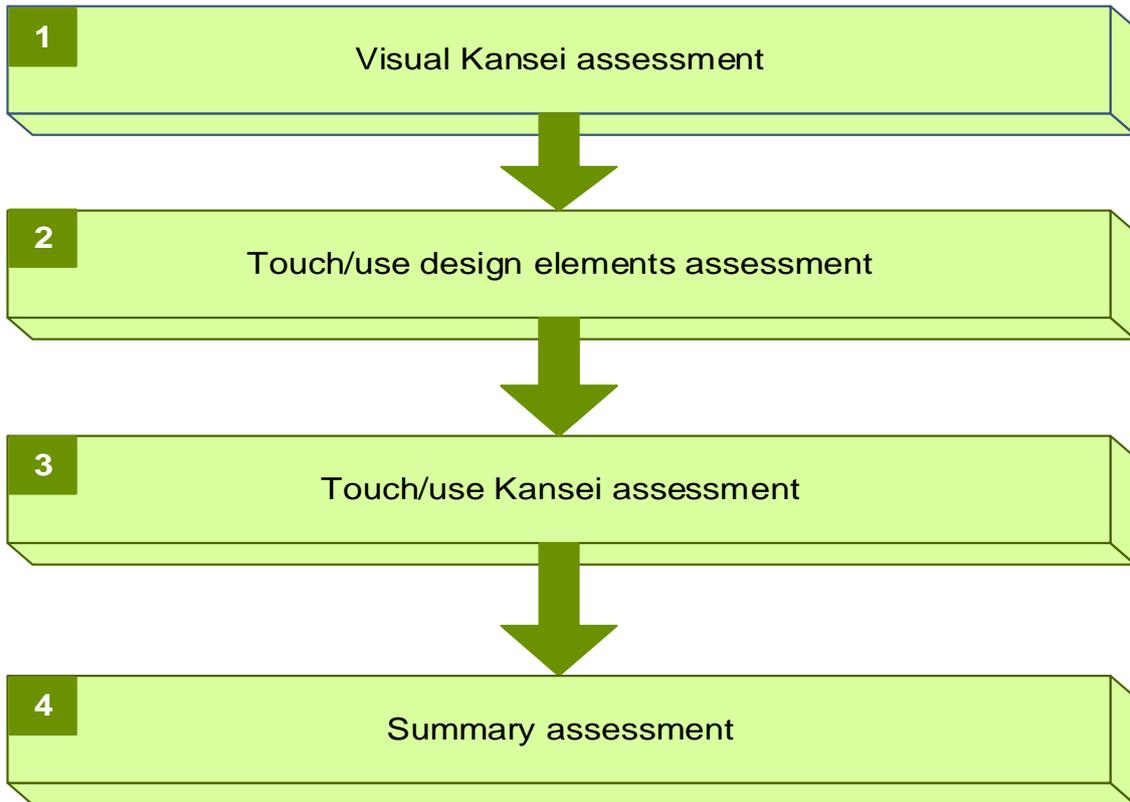


Fig. 1. Steps of emotional user experience assessment of food packages

A. Package Assessment

At steps 1 and 3 emotional the user experience is assessed by Kansei word pairs (Kanamori et al., 2005), (cf. Fig. 2 and Fig. 4) using a five-point semantic differential scale, e.g. scale "Like ←5-4-3-2-1→ Dislike". The average numerical value (3) reflects the neutral user rating (cf. Fig. 3).

On Fig. 2 the visual assessment of the package using 10 Kansei word pairs is shown (S. T. W. Schütte, Eklund, Axelsson, & Nagamachi, 2004). On Fig. 3 is shown an example for visual Kansei assessment of food package illustrated by two Kansei word pairs “Fresh Cheese-Not Fresh Cheese” and “Like-Dislike” (Nagamachi, 2008).

On Fig. 4 Kasei assessment by customer of food package after touching and using it is presented. The consumer gives his/her subjective ratings for 11 Kansei word pairs. On Fig. 5 an example how to use the checklist for assessing emotional user experience regarding two Kansei word pairs “Funny-Boring” and “Good design-Bad design” after using/touching the package is shown.

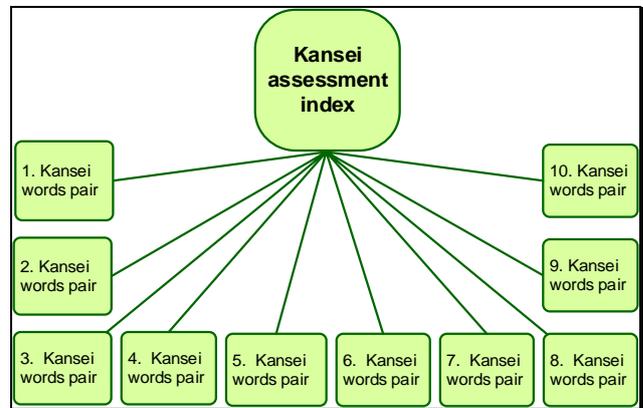


Fig. 2. Visual Kansei assessment

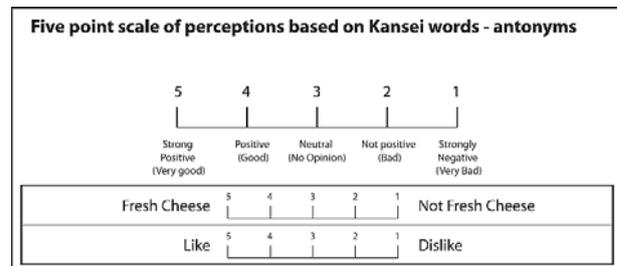


Fig. 3. Example for Kansei assessment of visual emotional user experience using two Kansei words

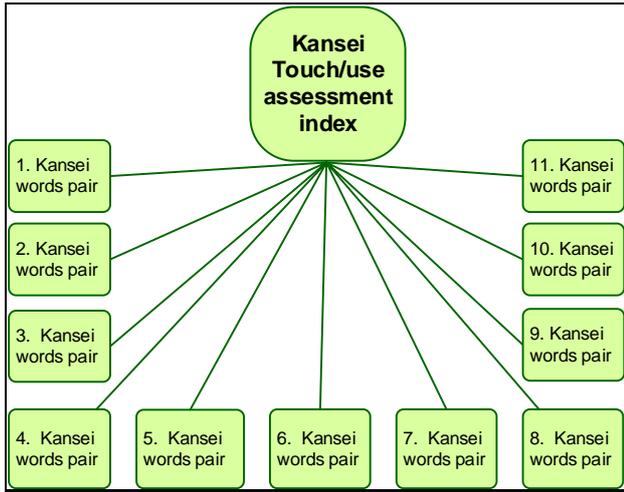


Fig. 4. Touch/use Kansei assessment

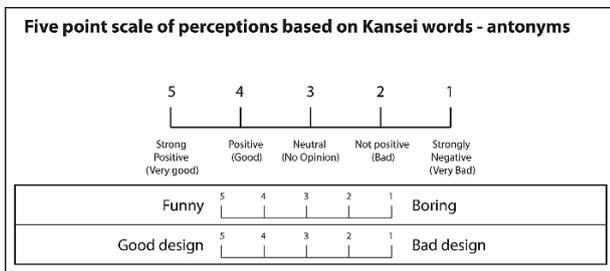


Fig. 5. Example for Kansei assessment of touch/use user experience using two Kansei words

B. Package Design Elements

At step 2 the user is giving his/her ratings (values) of package design elements (cf. Fig. 6 and Fig. 7). 23 design elements for food packages are determined like form, shapes, physical dimensions, fonts, surface, structure of the material concerning the graphical appearance of the package, etc. For each element its relevant values are defined.

The values of the design element form (1) are: 1) rectangular (V1); 2) trapezoidal (V2); 3) polygonal (V3); 4) cylindrical (V4) and 5) conical (V5) (cf. Fig. 2). The selection of these values is based on current reproduction technologies (Berger, 2002).

The color palette (design elements 2-3) includes primary colors for the predominant color when its value exceeds 50% of total package surface and additional colors which typically are around or below 30% of the total package surface.

Another visual and physical element determining the customer perception is the package size (design elements 4-6) with the following three sub-categories: height, width and volume (Lesot, 2010).

The design elements (7-21) are connected with graphic design characteristics: value of the image, image size, font, trading name, spelling of the brand name, size and location. They have a significant marketing importance by influencing consumer purchasing decision (Nagamachi et al., 2008; Schütte, 2013).

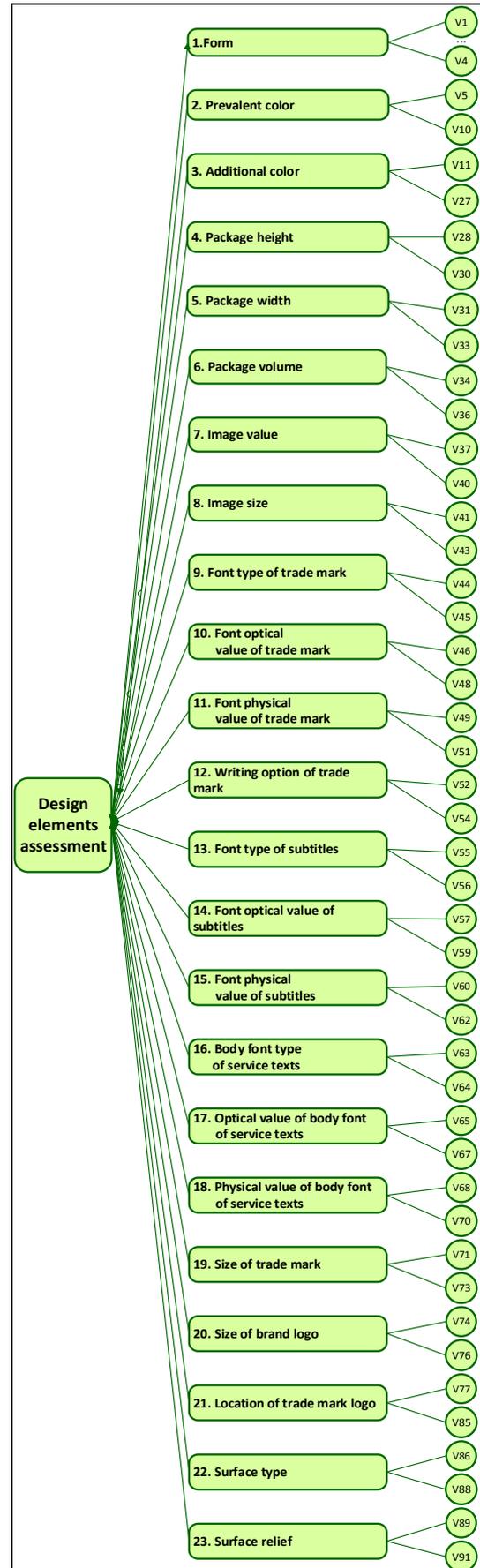


Fig. 6. Structure of design elements

The physical characteristics of the surface (22-23) of this type of packages are: matte, glossy or combination of the two, also embossed surface structure. They influence the overall quality of the package and hence the product. (Berger, 2002; Chia-Pei, 2010).

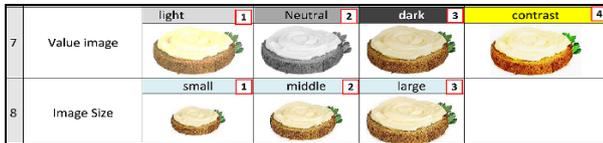


Fig. 7. Example of design element image value (7)

III. CONCLUSIONS

A checklist for Kansei assessment of packages in food industry is developed. It integrates emotional, usability and technological design aspects with the aim of packages design. The checklist includes design elements like form, basic and complimentary colors, size, image, font, logo, structure of the package. It measures customer feelings while observing and using a food package. The checklist can be used for Kansei assessment and design of food industry packages based on data collected from customers while observing and using milk packages. Each participant is free to get up and carry close visual contact with each of the studied objects, to touch, catch, open and pour each food package. It enables the allocation of emotive design-oriented problems and thus defining relevant design recommendations. Significant improvement of the emotional user experience with food packages can be expected after implementation of design recommendations. The advantages of the checklist are: (1) measuring of emotional responses of package customers; (2) supporting allocation of Kansei-oriented problems and defining of recommendations for package redesign. The checklist supports applications of Kansei engineering in food package design.

REFERENCES

- Barnes, C., Childs, T., Henson, B., & Lillford, S. (2008). *Kansei engineering toolkit for the packaging industry*. The TQM Journal, 20(4), 372-388.
- Berger, K. R. (2002). *A brief history of packaging*: University of Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences. (online): <http://edis.ifas.ufl.edu/ae321>
- Chang, Y-M., Chiung-Pei, C., & Min-Yuan, M. (2013). *Exploring the Visual Cognitive Features on the Design of Car Based on the Theory of Eye-Tracking Technology*. p. 4 (online): http://www.red.pe.org.pl/abstract_pl.php?nid=7134
- Chia-Pei L., Miao-Wen H., Kuohsiang, C. (2010). *Kansei Study On Paper*. KEER2010 – Paris, France, p. 188-195.
- Chiu, T.-P., & Ho, C.-H., (2013). *The Study of Emotion Responses when Applying Scents to Products*. Chiba University, Faculty of Engineering Design, p. 1-12, (online): <http://design-cu.jp/iasdr2013/papers/1617-1b.pdf>
- Desmet, P.M.A. (2005). *Measuring emotion: Development and application of an instrument to measure emotional responses to products*. Funology, (p. 111-123): Springer.
- Desmet, P.M.A., & Hekkert, P. (2002). *The basis of product emotions*. Pleasure with products, beyond usability, p. 60-68.
- Garrett, J-J. (2010). *Elements of User Experience, The: User-Centered Design for the Web and Beyond*: Pearson Education.
- Huang, C.-I., & Guan, S.-S. (2009). *A Study on Difference of Kansei Imageries Based on the Degree of Involvement—Using Chocolate Package as An Example*. Southern Taiwan University of Science and Technology, p. 1-7.
- Kanamori, T., Imai, Y., & Takeno, J. (2005). *Extraction of 430,000 association words and phrases from internet web sites*. Mechatronics and Automation, IEEE International Conference, 10(4), 1929-1934.
- Lee, S, Harada, A., & Stappers, P. J. (2002). *Pleasure with products: Design based on Kansei*. Pleasure with products: Beyond usability, p. 219-229.
- Marco-Almagro, L., & Tort-Martorell, X. (2012). Statistical methods in kansei engineering: a case of statistical engineering. *Quality and Reliability Engineering International*, 28(5), 563-573.
- Lesot, M.J., Bouchard, C. Detyniecki, M. Omhover, J.F. (2010). *Product Shape And Emotional Design*. KEER2010 – Paris, France, p. 145-154.
- Nagamachi, M. (2002). *Kansei engineering as a powerful consumer-oriented technology for product development*. *Applied ergonomics*, 33(3), 289-294.
- Nagamachi, M. (2008). *Perspectives and the new trend of Kansei affective engineering*. The TQM Journal, 20(4), 290-298.
- Nagamachi, M., Tachikawa, M., Imanishi, N., Ishizawa, T., & Yano, S. (2008). *A successful statistical procedure on kansei engineering products*. *Electronic Conference Proceedings*. (online): <http://www.ep.liu.se/ecp/033/084/ecp0803384.pdf>.
- Norman, D., A. (2007). *Emotional design: Why we love (or hate) everyday things*: Basic books. (online): [http://www.researchgate.net/publication/224927652_Emotional_Design_Why_We_Love_\(Or_Hate\)_Everyday_Things/file/e0b49522030e4d5767.pdf](http://www.researchgate.net/publication/224927652_Emotional_Design_Why_We_Love_(Or_Hate)_Everyday_Things/file/e0b49522030e4d5767.pdf).
- Schütte, S. (2005). *Engineering emotional values in product design: kansei engineering in development*. (Doctoral thesis, comprehensive summary), Linköping, Institutionen för konstruktions- och produktionsteknik. (online): <http://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-497>.
- Schütte, S. (2013). *Evaluation of the affective coherence of the exterior and interior of chocolate snacks*. *Food Quality and Preference*, 29(1), 16-24.
- Schütte, S. T.W., Eklund, J., Axelsson, J. RC, & Nagamachi, M. (2004). *Concepts, methods and tools in Kansei engineering*. *Theoretical Issues in Ergonomics Science*, 5(3), 214-231.