

A "KANSEI" APPROACH TO V.E. THAT MAXIMIZES THE USE OF HUMAN SENSES

Hyozo Nakajo, CVS
Nippon Columbia Co., Ltd.
Tokyo, Japan



Hyozo Nakajo, CVS, is Chief Engineer at VEC Center, Music Entertainment Division of Nippon Columbia Co., Ltd., and acts as an in-house VE consultant on solving problems in management improvement. Employed at Columbia since 1956, he has built his VE expertise by first working in its Purchasing Division. His later exposure to music entertainment businesses has led him to his professional exploration into the relationship of product functions and human sensibility. He has developed his unique KANSEI approach to VE for application in such areas as customer needs research, new products development, and organization structure and systems. Mr. Nakajo is an active member of not only SJVE, but also Japan Society for Business Planning, Break-through Thinking activity, Hitachi Suppliers VE Research Teams, and others.

ABSTRACT

This paper solely deals with a new approach to defining product functions as closely related to human sensitivity, and in contrast with the traditional definitions of Use Function and Esteem/Esthetic Function. The author proposes to clarify the types of sensitivity-related functions, by discussing how such functions can be best expressed, and how such approach can stimulate creation of more ideas. This approach does not limit the use of expressions as standardized in the conventional "verb and noun" combination.

ed function, novel technologies and customized services as such.

Accordingly, the scope of VE application has been expanded from "physical commodities or hardware products" to such "software" aspects as information, communication and services. Themes to be taken up in VE research, too, have tended to shift from physical technologies for mass processing, massiveness and high speed to human-centered psychological approach to customer satisfaction for diversification, conservation and interpersonal communication. In brief, it can be said that we practitioners are at a turning point from "business centered VE" to "customer-centered VE."

INTRODUCTION

In the more than half century history of VE as originated by the late Mr. L.D. Miles, the methodology has widely proved its effectiveness. Meanwhile, the world of industry has experienced a remarkable change from the Age of affluence and mass production to the Age of human welfare and environment protection. Customers have come to believe in subjective and individualistic values in terms of design variety, very specializ-

Human technologies for diversification, conservation and information intensiveness are now turning the wheel toward "creating human-life diversity for personal preference, fashion, and feeling of life" rather than mere "technology advancement" and "commodity affluence." In other words, people are beginning to discover knowhow for better looking at human elements rather than merely finding marketable businesses.

Value engineers can paraphrase this "Finding knowhow for looking at human elements" as "Identifying functions as related to human sensibility." So that we can modify our VE research to such changing situations and circumstances, we must broaden the basic scope of product/service functions by not only dealing with conventional Use functions and Esteem functions but also by encompassing such human attributes as amenity, comfortability, convenience and individual preferences.

The author believes that, whereas the traditional "hardware-centered" way of Functional Definition uses verbs and nouns only, functions related to human sensibility need to be expressed more comprehensively by somehow adding adjectives, adjective verbs and adverbs to the basic verbs and nouns. In this way, elements of human sensibility can be reflected in more precisely defining functions.

A NEW FRAME OF REFERENCE FOR FUNCTIONAL DEFINITION

The most remarkable two characteristics of VE Job Plan could be "application of functional definition" and "team design activities by multi-disciplinary professionals" as the basis of function-centered approach. So that these two characteristics can be fully demonstrated in creating ideas for fully satisfying present-day customer needs, a new method or technique of functional definition must be adopted.

The meaning of the word KANSEI

KANSEI as used in some of the illustrations of this paper is the Japanese word expressing "human sensibility" in appreciating not only esthetic but also functional value of products and services. For the purpose of this paper, KANSEI is translated as a "sensibility oriented attribute" in adult human mind.

The aim of functional definition

Functional definition is basically aimed at enabling everybody to objectively perceive a certain concept, as concisely expressed in a standardized

combination of a verb and a noun, and made distinguishable from other concepts. Specifically, it is to 1) identify a function, 2) evaluate it, and 3) and induce a smooth flow of improvement ideas.

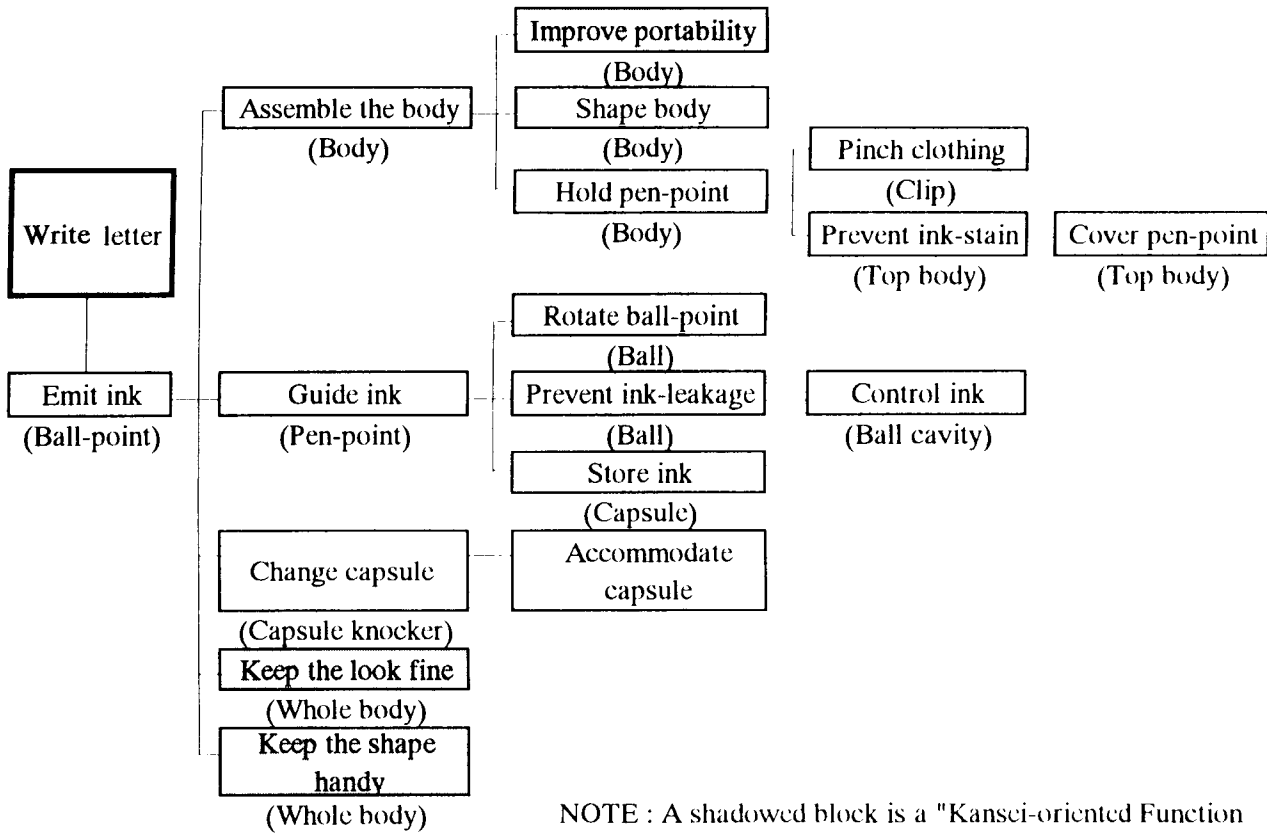
Let's give a further look at these three. The first two aims are to clarify the relationship between WHY (purpose) and HOW (means) through simple use of abstract expressions, and the third aim is to stimulate members' creative power by using the characteristics of verbs, which can expand the abstract scope of predicative expressions. This should result in yielding many quality ideas.

The traditional concept of Function Definition and its potential problems

Figure 1 is a typical Functional Diagram of a ball-point pen, shown together with a list of its customer requirements. These data can be characterized as "little containing such expressions of human sensibility as related to what kind of products a customer really wants to have for a pen. Product size, performance, specification, etcetera only deal with product's physical features. The diagram itself generally illustrates all functions, but without distinguishing use functions and esteem functions each other when customers' specific requirements should be considered. For instance, appearance and shape are not connected on the diagram with specific parts of the pen but only one "inclusive" set of words "keep the look fine" applicable to any part of the product. The main body of the pen where use-centered functions should be distinguished from sensibility-oriented functions each other, but both are simply described in one functional statement "Improve portability." If we remain at this level of functional definition, the depth of VE study remains to be very shallow and roughly "all comprehensive."

It is the author's belief that Esteem functions and some Use functions as closely related to human sensibility must be minutely considered over general definitions of many use functions of the product.

< A Conventional FAST Diagram >



Customer requirements for a good ball-point pen

Primary function & quality (for line-drawing)	(1) It should draw a more than 1,000 meter line with no ink-dripping nor ink stoppage (2) The width of a line should be 0.3mm within the range of +0.2mm & -0.1mm
Portability	(1) Within a dimension of 170mm length by 20mm diameter (2) The pen body can be fixed on the clothing
Maintainability	(1) The pen-point can be covered (2) The pen-point (ink-capsule) can be replaceable
Safety	(1) No safety hazard in the use (2) there should be no ink leakage

A Ball-point Pen

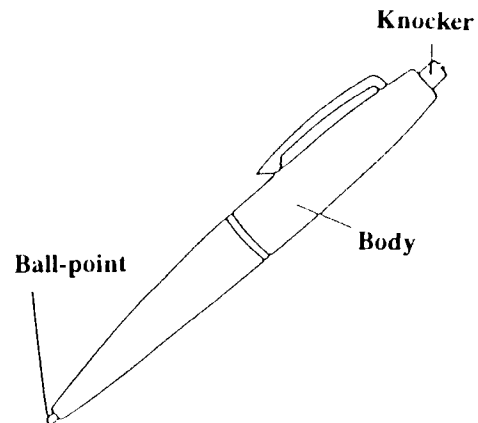


Figure 1 : Conventional FAST diagram Expressions : A Ball-point Pen

If all Value Engineers feel satisfied with this standard level of functional definition and idea creation, they are only in a position to superficially "guess" what customers would really want on their sensibility level, if not missing the salient point .

NECESSITY FOR SENSIBILITY-ORIENTED FUNCTION ANALYSIS

Many of the objects of functional definition encompass not only Use functions but also sensibility-related functions (including Esteem functions). Real functional deployment cannot be completed without clearly expressing such functional relationships.

Sensibility-oriented functional definition

Figure 2 (see next page) represents author's notion of a Functional Diagram of a ball-point pen, which incorporates customer dictated sensibility oriented functions, along with a listing of all customer requirements. The underlined passages (mostly adjectives and adverbs) in the Customer requirements list have been made to result in additional functional statements in the figure. The diagram thus developed can enable concerned interdisciplinary team members really perceive specific customer needs.

With such needs clarified in the diagram, all potential sensibility oriented functions can be readily identified by the concerned members.

This functional diagram incorporates all such sensibility-oriented functions, which are distinguished by "hatching" in Figure 2.

Through a process of specified functional definitions to clarify the relationship of all use functions and esteem functions in each functional area, the diagram now renders easier understanding of specific customer needs related to the product being developed.

In this diagram, such functional expressions as "Write letters comfortably,"

"Improve portability," "Improve operability," "Maintain neatness of operation," and "Make it feel 'now'" are examples of sensibility-oriented functions.

Thus, the process of functional analysis can be better facilitated by using not only Verbs and Nouns but also their modifiers such as Adjectives, Adjective verbs and Adverbs to be incorporated in the functional statements.

As outlined in the Introduction of this paper, "customer need" in its true sense cannot be perfectly stated in the functional diagram without incorporating those sensibility oriented functions in the functional analysis.

How sensibility oriented functions can be effectively defined

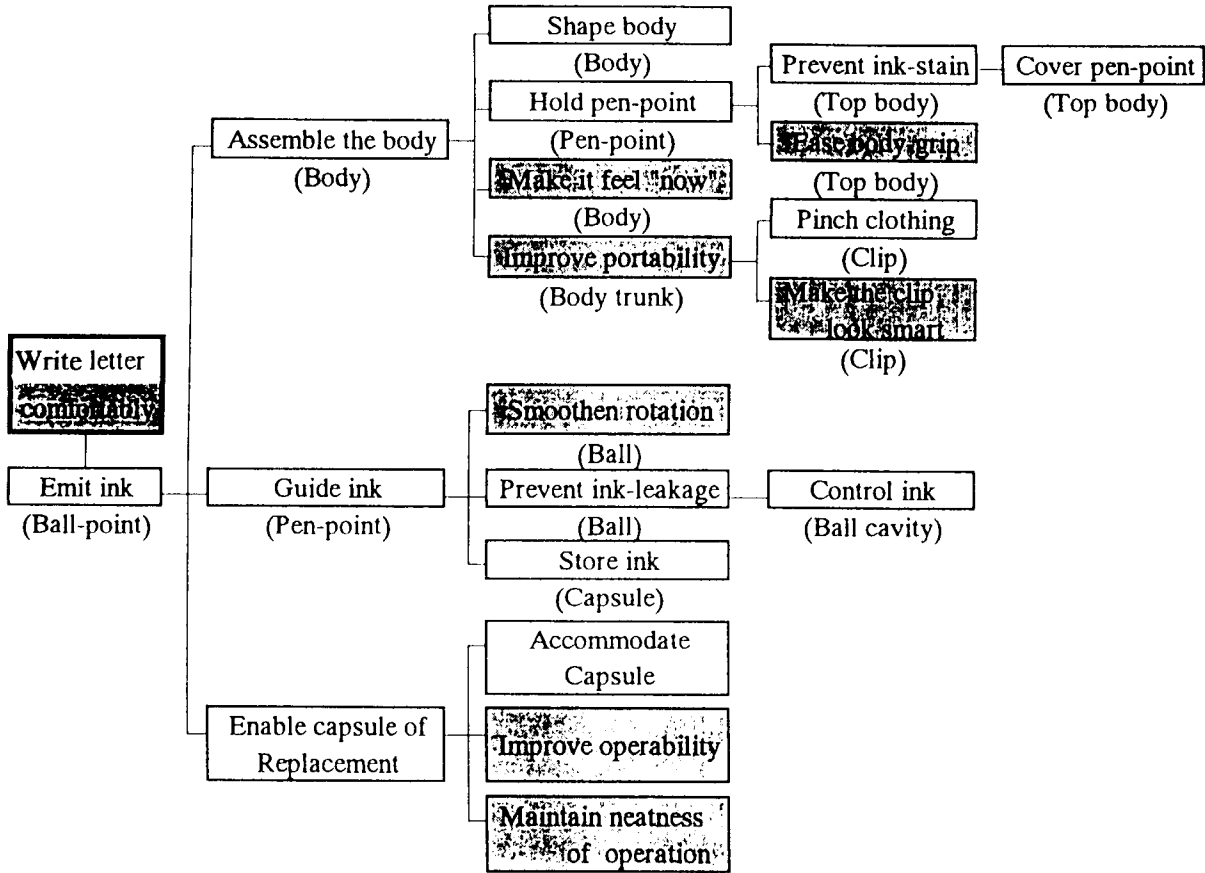
The preliminary step for such functional definition is to collect all specific customer needs and to pick up all sensibility related conditions, ranging from a "must" to "nice to have."

In defining those functions, utmost care must be taken to examine the relationship of individual Use functions and Esteem functions as being connected with any sensibility-oriented expressions as part of such functions.

The standard expression to define functions a ball-point pen can be grammatically analyzed as follows:

(Subject)	(Predicate)
	[Verb] [Noun]
<u>A ball-point pen</u>	<u>writes</u> <u>letters.</u>

Pen's function is simply represented in verb "writes" in this case. Apparently, this does not imply any sensibility-oriented human needs such as "writes smoothly" or "writes comfortably." It is because a verb by itself cannot express any human needs without being "modified" by addition of Adjectives, Adjective Verbs and Adverbs. We now need to know HOW such functional verbs can work.



NOTE : A shadowed block is a "Kansei-oriented Function"

Customer requirements for a good ball-point pen

Primary function & quality (for line-drawing)	(1) The ball should <u>roll smoothly</u> and the pen should <u>draw a clear line</u> more than 1,000 meter <u>smoothly</u> (2) The width of a line should be 0.3mm within the range of +0.2mm & -0.1mm (3) There should be no ink leakage
Portability	(1) Within a dimension of 170mm length by 20mm diameter, and sharp should be of "now" feeling, and also be <u>easily pocketable</u> so as to prevent "missing" (2) The pen body can <u>be secured</u> and <u>look neat</u> on the clothing (3) The knocker can be operated <u>smoothly</u>
Maintainability	(1) The pen-point can <u>surely be covered</u> for storage (2) The pen-point (ink-capsule) can be replaced <u>easily</u> and <u>smoothly</u>
Safety	(1) No safety hazard in the use to prevent <u>by removing all sharp edges</u> (2) No part of the pen's structure or its materials should <u>serve as a stimulant to human body</u> (3) There should be no ink leakage <u>when using the pen</u> or <u>when carrying it around</u>

Figure 2 : A Proposed kansei-oriented FAST diagram
 < using Adjectives, Adjective Adverbs in addition to Verbs >

Figure 3 illustrates how this sensibility approach can be effectively applied to such non-hardware areas as physical distribution.

Many of sensibility-oriented words seem to mean something in vision or future, and diversified customer needs may need specific modification of nouns and verbs as used in functional definition. In sensibility oriented functional definition, there are instances where you need to modify nouns and others where you have to modify verbs. Here are specific examples in both cases.

1. Modification of nouns

[Subject] [Verb] [Noun/adjective/adverb]
 (-----Predicate-----)

- a. A pen writes letters comfortably.
- b. A knocker retains neat operations.
- c. P.D.* dictates speedy transport.
- d. P.D. develops exact delivery plans.
 (*" P.D." = Physical distribution)

Adjectives and/or adverbs in these four examples modify functional verbs in a sense of sensibility expression. Some verbs can be used for such expression if used as Adjective verbs.

2. Modification of verbs

[Subject] [Verb] [Noun/adjective/adverb]
 (-----Predicate-----)

- a. Pen's body makes its use easier.
- b. Knocker makes its operation smoother.
- c. Packaging improves appearance better.
- d. P.D. lets handling easier.

While above examples may sound awkward in English language because of the east-west difference in grammatical structures, the author can say that in Japanese grammar Adjective verbs can be used here to facilitate sensibility-oriented expressions.

SENSIBILITY-ORIENTED WORDS

A prevailing tendency in the use of sensibility-oriented words is that new words keep coming into life due to ever changing market fashions and customer life-styles as such. Some of them may even be out of grammatical rules. Yet, people who create these new words generally seem to be of a high level of human sensibility and able to think and act ahead of conventional ways of living. As such new words become well "brewed" in the society, they can be considered as words of expressing sensible aspects of life.

Characteristics of sensibility oriented words

Sensibility oriented words as have been used in the foregoing three functional diagrams can be classified as follows:

Adjective: Speedy
 Assured
 Beautiful

Adjective verbs: (not in the true sense of English grammar but in a Japanese way of use):

Make it feel "now"
 Make it easy
 Smoothen
 Make it better

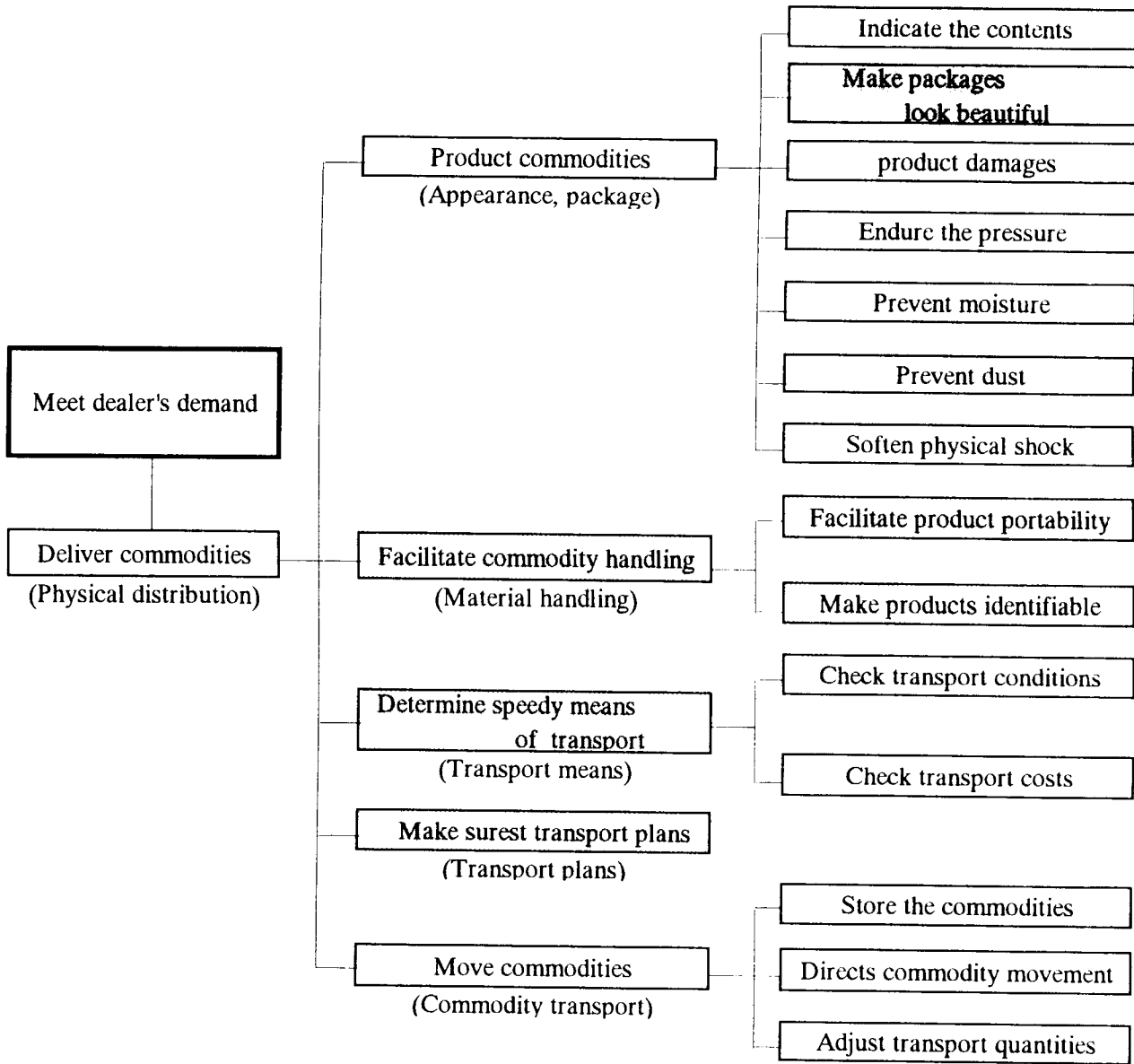
Adverbs: Comfortably
 Sharply
 With ease
 In a sure way

Effectiveness of sensibility-oriented words

Verbs being used in this category tend to bear a characteristic that can abstractively encompass a wide scope of expressions. Such a tendency certainly triggers freewheeling activity of the brain in idea creation as related to Use functions.

Adjectives and adjective verbs also are of the very same characteristic as

< An example FAST diagram in Physical Distribution >



NOTE : The shadowed blocks represent Kansei-oriented functions

Figure 3: A Proposed Kansei-oriented FAST Diagram, Non-hardware category

that of verbs, each reflecting what customer sensibility is headed for. These prove to be effective each as a keyword for idea generation related to sensibility oriented functions.

How to collect and use sensibility-oriented words of expression

Sensibility oriented expressions keep changing by age and time. A fresh expression now, most clearly reflecting today's human sensibility may disappear tomorrow in an eternal cycle of appearance and disappearance. Thus, the work of collecting such words only at times of necessity may be a tough one.

Table 1 is an author's summarized collection of such sensibility oriented words of expression at the present moment. It is important for this sensibility-oriented approach to keep collecting and maintaining such a fresh treasure of words so that they can be used in seeking for real customer satisfaction.

CONCLUSION

The scope of VE application can even be wider when considering the aspect of human sensibility, but research on product functions from a sensibility viewpoint is just beginning to bud. From that angle, the author proposes ways to identify sensibility-oriented functions as well as methods to correctly express specific aspects of human sensibility.

The author's proposal can be summarized as follows:

- * Both Use functions and Esteem functions encompass functions as related to human sensibility.
- * In defining sensibility-oriented functions and expressing them in words, use of adjectives and other parts of speech must be used as combined to the traditional way of "verbs and nouns."

These proposals can be justified under the following specific aims:

- * To identify as many sensibility-oriented functions as can be discernible from present-day market customers.
- * Simple use of adjectives in the functional research, deeper understanding of sensibility subjects can be obtained from a multi-disciplinary pool of human brains, resulting in rich generation of ideas for product development and improvement.

With this paper as a breakthrough to a new field of functional research, the author pledges further work and hope to see this presentation be of any helping suggestion to all VE practitioners.

Table 1: Typically Kannsei-oriented Expression

Sensory factor	Element of expression		Kannsei-oriented expressions (sensory description)							
	Broad category	Specific category	Brilliance	Freshness	Cleanliness	Materialistic feel	Volume feeling	Unity and / or wholeness	Peculiarity / uniqueness	Human sentiment
Five senses plus	Visual (see)	Color, design, surface	Chic, flippant	Refined, clumsy	Clean, filthy	Natural, artificial	large, small	United, disunited	Characteristic, mediocre	Interesting, dull
		Formative	Showy, plain	Decent, indecent	Sharp, dull	Authentic, imitation	Many, few	Integrated, separate	Rare, conventional	Safe, unsafe
		material	Gorgeous, modest	Modern, classic	Lucid, cloudy	Warm, cool	Thick, light	Thick, thin		
	Tactual (touch)	Sensory feel, feel of operation		(Novelty)	(Fitness)	(touch, smoothness)		(harmony, complicity)	(Uniqueness)	(Sentiment)
	Olfactory (smell)	fragrance, odor								
Patatal (taste)	tongue taste									
Body feel, other senses	Sense of acceleration									