

# The Development of AIM, an Idea Generation Support System for Products with affecting experience

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**Abstract:** These days in Japan, due to advancing technological innovation and diversifying standards of living, people have begun to pursue more affluent lifestyles. Accordingly, levels of satisfaction demanded by users have also risen, thus increasing the need for innovative planning to satisfy demand. This study aims to examine planning methods whose prerequisite is to “provide affecting experiences” in order to ensure higher levels of satisfaction. Thus, the authors of this paper conducted user surveys and devised the Associative Idea Map (AIM), which is a method for making a reasonable proposal including its operation within companies. This paper sheds light on devising processes and operational methods for the AIM.

**Key words:** *Idea generation, Experience, Requirement definition, Development, Emotion*

## 1. Introduction

The concept of human-centered design<sup>[1]</sup> has recently begun to penetrate the Internet and embedded industries as a development process aimed at improving usability. The basic concept of human-centered design is the manufacturing of products without losing user viewpoints during the development process. It is now believed that systems developed on the basis of this concept will ultimately be capable of achieving a system that guarantees usefulness, efficiency and satisfaction according to the actual use conditions of users.

These days, however, due to advancing technological innovation and diversifying standards of living, people have begun to pursue more affluent lifestyles. Accordingly, levels of satisfaction demanded by users have also risen, thus increasing the need for innovative planning in accordance with the basic philosophy of human-centered design to satisfy demand.

This study aims to examine planning methods whose prerequisite is to “provide affecting experiences” in order to ensure higher levels of satisfaction.

Now, can we imagine what it is we should do to draft a plan for products and services that are capable of evoking affecting experiences? This question is routinely asked within corporate departments involved in planning. According to the experience of the authors of this paper, the creation of ideas through brainstorming is generally

considered to be the first step toward studying in many corporate departments. It is true that if you hold an effective brainstorming session, it is highly likely that epoch-making ideas can be created. However, depending on the vagueness of themes, brainstorming procedures and experience of participants, it may become difficult to come up with effective ideas in a short amount of time, thereby causing the brainstorming session to be stalled. That is to say, even if a brainstorming session were held under the theme of “provide affecting experiences” at a company, it would be difficult to perform reasonable planning.

Thus, the authors of this paper conducted user surveys and devised the Associative Idea Map (AIM), which is a method for making a reasonable proposal including its operation within companies. This paper sheds light on devising processes and operational methods for the AIM.

## 2. Summary of the AIM

### 2.1 What is AIM?

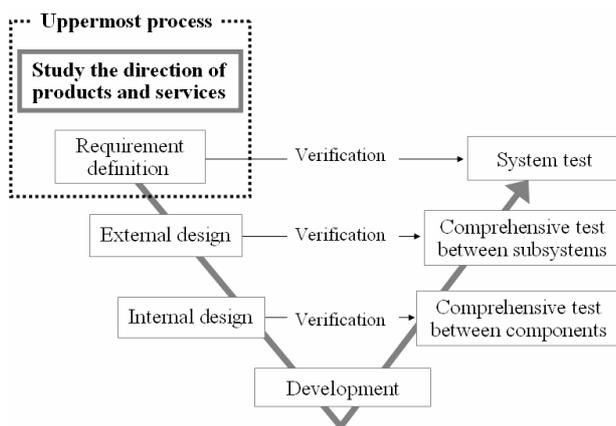
AIM is the acronym for Associative Idea Map and refers to a tool used to support the planning of products with affecting experience. The name of this tool also connotes aiming to generate affecting experiences from the planning phase.

The AIM consists of the “keyword sheet for affecting experience elements,” as shown in Fig. 4, which was

created based on actual user experiences, and the “idea expansion sheet” in Fig. 5, which is a form of keyword expansion procedures, and is premised on the assumption that it will be used for developers to expand their ideas about new products.

## 2.2 Scope of application of the AIM in development processes

It is believed that designing by incorporating information from user viewpoints in upper development processes will help improve usability.<sup>[2]</sup> In current system development, however, there are many cases in which development is under way despite the fact that the direction of products and services remains vague because it is unclear what happiness or affecting things users can experience by using the system concerned during the requirement definition phase. In these cases, the system will ultimately work, however, it is difficult to design to be affected according to using the system.



**Fig. 1 Scope of the AIM’s availability in the V-shaped model in system development processes**

Figure 1 describes a process model for system development. Development basically proceeds according to decisions made during the requirement definition phase. Therefore, requirements for affecting experience need to be incorporated during the requirement definition phase. That is to say, we consider the AIM to be an applicable tool for studying the direction of products and services in the uppermost process, which is the phase prior to defining requirements.

## 3. Study of the affecting experience mechanism

### 3.1 Way of thinking regarding affecting experience elements

As the premise of studying the theme of “provide affecting experiences,” we must first clarify the mechanism of affecting experience and define the necessary elements.

According to *Kojien*, the most authoritative Japanese dictionary, “having affecting experience” refers to “touching our hearts and stirring emotions.” Following this definition, if we can make a proposal that has incorporated a touching element, it is possible to provide affecting experiences.

### 3.2 Affecting experience mechanism and its elements

Let us now consider the affecting experience elements necessary for making proposals by citing specific examples. When we create a situation in which we appreciate a certain painting, some people will be affected when looking at the painting while others will not. We assume that different people react differently because they have differing values in regards to the painting. Of course, there are also values common to numerous people. And we can safely say that the contributing factors to the formation of those values lie in individual experiences.<sup>[3]</sup> This paper refers to this as the empirical database (values).

Given this perspective, we have an affecting experience when we react to an element of the empirical database (values). We generally use the phrase “touch someone’s heartstrings,” and believe that this phrase demonstrably describes the state in which we are affected upon responding to the empirical database (values).

If we are to return to the aforementioned example and consider an affecting experiences in light of this definition, it equals responding to a preference (i.e. value) based on individual experience after looking at (i.e. experiencing) a painting (i.e. quality).

Viewed from a slightly different angle, even when the same person looks at the same painting, it appears differently depending on whom he or she may look at it with or what the surrounding environment may be. For example, it would look different when you look at it closely on your own or when you look at it together with several others. In addition, we do not know whether we will be affected when our inner conditions are unstable (e.g. mentally, such as feeling depressed, and physiologically, such as wanting to go to the restroom). We refer to this situation as background information, and it is essential that we consider situations like these.

However, when we plan, it is impossible to cover all possible situations because we cannot define what it takes to cover everything. Thus, when we carry out planning, we make it a rule to sort out the output of ideas by specifying conditions and creating scenarios incorporating affecting experience elements under the said conditions.

This mechanism is summarized in Fig. 2: when we “experience” the “quality,” we crosscheck it with our empirical database (values), and when it touches our heartstrings, we have an affecting experience.

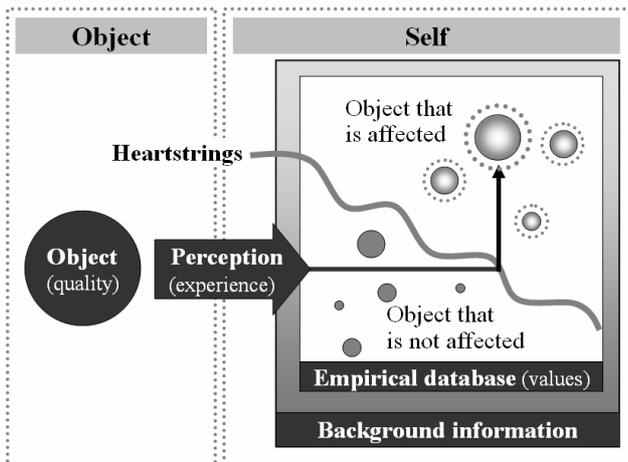


Fig. 2 Mechanism of affecting experience

#### 4. AIM-devising processes

The authors of this paper et al. established the AIM by hypothesizing that affecting experiences can be provided to users by restructuring the combination of “values,” “quality” and “experience,” which constitutes the three elements required for affecting experience and defined in the mechanism of affecting experience.

##### 4.1 Development of the keyword sheet for affecting experience elements

Aiming to select the elements necessary for evoking affecting experience, i.e. “values,” “quality” and “experience,” and the method of combining these elements, we performed our study according to the following procedures:

###### (1) Elaboration of affecting experience elements

The keywords serving as the elements of affecting experience were selected from the results of a questionnaire we conducted for 100 people in an open response format on the Internet. More specifically, we asked each respondent to make a specific description of the four patterns concerning the object he or she was affected about, an episode from his or her experience and specific details about the affecting experiences. We then

collected all 400 examples of affecting experiences. When we asked questions, we specified four scenes, i.e. “when you found it,” “when you bought it,” “when you used it” and “other,” to ensure that examples of affecting experiences would cover broad areas.

Next, with the intent of selecting affecting experience elements, a total of three interaction designers and usability engineers confirmed each and every example of affecting experiences while enumerating the elements that would be necessary for affecting experience and that could be read from those sentences as keywords. The keywords were chosen for the three elements necessary for affecting experience, i.e. “values,” “quality” and “experience.”

With three different keyword collections, a series of works were repeated several times to put together affecting experience elements while comparing respective keywords, selecting those whose content and circumstances could easily be envisioned and compensating for missing elements.

To cite examples of keywords, when people looked at a famous painting they had long wanted to see and felt impressed by its beauty, the keywords applicable to “values” included “have a special fondness for the painting” and “have long waited for an opportunity to see it.” Those applicable to “quality” include “famous” and “scarcity,” while those applicable to “experience” include “have finally seen the painting” and “enjoyed the painting.”

In addition, the keywords were examined to determine whether or not the wording was appropriate from the following perspectives: whether levels of keywords are constant, whether the wording could faithfully reproduce the images and whether the wording was easy to expand from the viewpoint of those who generate ideas about products.

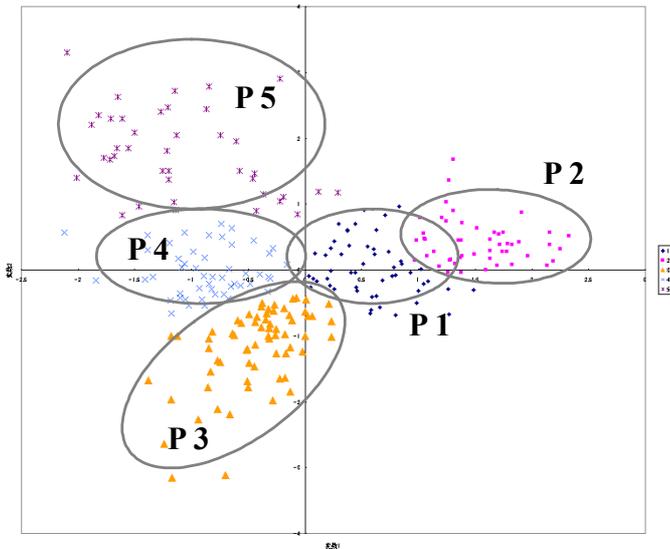
###### (2) Selecting combinations of keywords that are prone to be affected

Although each keyword for affecting experience elements has the potential to cause users to be affected, individual expansion of those keywords does not fully evoke affecting experience. Thus, the authors of this paper analyzed the effective combination of “values,” “quality” and “experience” to see what combination of keywords would easily evoke affecting experience.

From among the 400 examples of affecting experiences that were used in selecting affecting experience elements, those whose content was overlapping and whose descriptions were too complicated to be envisioned were removed. We then analyzed the remaining 259 examples and studied whether or not the keywords for affecting experience

elements would be applicable to each and every example. Quantification Theory Type III was employed to process the examples: “1” was allocated to cases in which keywords applied to examples of affecting experiences and “0” was allocated to cases in which keywords did not apply.

Next, the scatter diagram in Fig. 3 was prepared by using the axis that strongly reacted according to Quantification Theory Type III. Cluster analysis was then performed on the variables of affecting experiences examples to classify the affecting experiences as shown in Fig. 3.



**Fig. 3 Classification of affecting experiences examples derived from correlation with keywords**

Using groups of affecting experiences, which were created by affecting experiences pattern, we selected the keywords for affecting experience elements representative of each group according to the appearance ratio. As a result of considering a balance for ensuring that keywords could be chosen from every element necessary for affecting experience, i.e. “values,” “quality” and “experience,” we deemed relevant the keywords with an appearance ratio of 15% or more and summarized them in the form of a keyword sheet for affecting experience elements as shown in Fig. 4.

**4.2 Operational methods and development of idea expansion sheets**

We created an idea expansion sheet like that presented in Fig. 5 by using a keyword sheet for affecting experience elements with the aim of evoking more powerful ideas from the development members.

The idea expansion sheet covers idea expansion procedures, thus enabling users to conjure up ideas and describe scenarios by simply filling out the sheet

according to the procedures. The procedures in the expansion sheet are as follows:

- a) Designate products that will serve as the objects of idea expansion.
- b) Select keywords for affecting experience elements.
- c) Conjure up images.
- d) Create the seeds of ideas.
- e) Conduct a brainstorming activity.
- f) Entitle ideas.
- g) Develop scenarios.

We will now explain these procedures using specific examples. The first step is to designate products that serve as the objects of idea expansion; for example, a car navigation system. The next is to select keywords for affecting experience elements. Here, we assume that a combination was selected from the keyword sheet for affecting experience elements as shown in Fig. 4 and choose one keyword each for “values,” “quality” and “experience.” Let us assume that we chose “have been pursuing,” “authentic” and “it was by accident” as the keywords.

	keywords												
	values			quality						experience			
P1	ほろがなかつた			最終の達成感	達成感	達成感	達成感	達成感	達成感	達成感	達成感	達成感	達成感
P2	思い入れがあった			思い入れがあった	思い入れがあった	思い入れがあった	思い入れがあった						
P3	思い入れがあった			思い入れがあった	思い入れがあった	思い入れがあった	思い入れがあった						
P4	思い入れがあった			思い入れがあった	思い入れがあった	思い入れがあった	思い入れがあった						

**Fig. 4 Keyword sheet for affecting experience elements**

The third is to conjure up images. We specifically describe keywords for the selected affecting experience elements while visualizing the designated product image. For instance, for the keyword “it was by accident,” we describe “displayed by accident” while visualizing a car navigation system. The same is true of the other two keywords. And the fourth is to create the seeds of ideas. Here, one good story is created by crossing the elements developed in the preceding step. It is important to incorporate all of the elements, i.e. “values,” “quality” and “experience.” For example, if there are images of “things we love,” “land that served as the origin of

history” and “being displayed by accident,” the three elements are combined to create the following seeds of ideas: “If we register things we love, the functionality lets us know the land that is associated with any of those registered things.” The next is to do some brainstorming. The purpose of this is to collect opinions from other members about the seeds of ideas that have been expanded thus far and further expand upon them. We then entitle ideas and develop scenarios. The type of amusement the created ideas will provide to users will then be described in a scenario format.

The form is titled "Idea expansion sheet A" and includes fields for "Name code", "Date", and "Sheet No. : A-". It features a "Target" and "keyword" field at the top. Below this, a horizontal flow of four stages is shown: "Select keywords", "Conjure up images", "Create the seeds of ideas (cross the elements)", and "brainstorming activity".

Values	Conjure up images	Idea No. (1)	MEMO
quality	Conjure up images	Idea No. (2)	
experience	Conjure up images	Idea No. (3)	

Fig. 5 Idea expansion sheet

## 5. Operation of the AIM

### 5.1 Trial operations

In June 2007, we performed four trial operation sessions of the AIM at Denso Corporation (four days). An accumulative total of approximately 80 people participated in the sessions. This trial operation threw light on the characteristics, effects and challenges of the AIM.

### 5.2 Characteristics and effects of the AIM

The difference between the AIM and other idea generation support methods is that the AIM generates idea of products with affecting experience through the combination of keywords for affecting experience. The AIM is believed to have an edge in supporting product planning for the following points when the aforementioned difference is taken advantage of:

The first point is that since the method is systematized, i.e. keyword combinations, even beginners can efficiently create ideas. Since one person can create three ideas when the idea expansion sheet is used, if you need a large quantity of ideas, you can attain the expected result by using the AIM.

The second point is the contingency of ideas due to

keyword combinations. Since there are cases in which some keyword combinations lead to the presentation of the conditions for idea generation even the conceptor did not expect, it is highly likely that we can encounter unforeseen ideas.

The third point is that the steps for idea expansion are visualized. Since thinking processes are recorded on the idea expansion sheet and the development members can share the records, they can not only share their thinking processes, but also divide the works of idea expansion among themselves. At the same time, it is conveniently managed because intellectual properties referred to as ideas can be managed on paper.

The fourth point is that idea expansion is possible from user viewpoints. The development of the three affecting experience elements, i.e. “values,” “quality” and “experience,” is nothing short of examining what experience should be provided to users to please them. Furthermore, by writing scenarios, it becomes possible to even propose relationships with users rather than the expanded ideas simply remaining as functional ideas. The aforementioned scenarios not only specifically record the thoughts of conceptors, but also serve as information that can provide viewers with an important clue for judging the convenience of functions.

### 5.3 Precautions for using the AIM

When using the AIM to expand ideas, we recommend that people come up with and expand keywords for affecting experience from user perspectives. Thus, when developers use the AIM, they need to be advised to eliminate their ideas regarding technical feasibility and forget about their ideas.

### 5.4 Challenges facing the AIM

Trial operation thus far has highlighted three challenges.

The first challenge is that the characteristics of keyword patterns for affecting experience have not been clarified. It can be expected that individual keyword patterns have different characteristics in terms of how to generate affecting experience and thus exert various effects depending on the products at issue and target users. It is believed that if the characteristics of keyword patterns serve as one of the criteria for selecting a keyword pattern, it becomes possible to increase the effectiveness of idea expansion.

The second challenge is that the method for reflecting the values of actual users has not been clarified. Even with one keyword, different users may associate different things with it. It has therefore been deemed necessary to become conscious of variations of values and conduct a

survey for actual users.

The third challenge is related to the handling of a database for expanded ideas. It was explained in the previous chapter that the AIM has the advantage of simple intellectual property management since ideas are recorded on paper. Considering the searchability and browsability of such information, computerized database management is regarded as being indispensable.

## **6. Conclusion**

### **6.1 Future development of the AIM**

We believe that further development will be required to make effective use of the AIM and support a wide variety of product development. In more specific terms, as mentioned in the preceding chapter about challenges, we must analyze the characteristics of patterns of affecting experiences and study utilization methods that take advantage of the characteristics. It is also possible to study how to make effective use of the AIM by the implementation of user groups.

Although we have developed the AIM by using the keywords of “affecting experience,” we believe that it can be developed in the same manner for other themes. We would like to seek and develop effective themes when developing new products.

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