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A SYSTEMS THINKING APPROACH TO AN ACTIVITY ROUSING CONSUMER'S BUYING MOTIVATION
—FOCUSING ON "*KANSEI* INFORMATION" IN POP ADS AND DIRECT MAIL—

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ABSTRACT

This paper discusses causalities between *kansei* information and consumer buying behavior and actions a firm can take knowing that *kansei* information influences such behavior. We regard information transmitted through point-of-purchase advertisements (POP ADS) at retail stores as one of the factors that incentivize customers to make purchases. Our focus is on *kansei* information, which is the result of cerebral processing of information obtained through the five senses, leading to positive affect. Since 2000, we have conducted research into the effects of *kansei* information on consumer buying behavior in various industries in Japan. Based on observations of such effects as well as firms' marketing and sales activities, we have explored a way to build a systems dynamics model centering on the effects of *kansei* information. In this paper, we consider messages contained in *kansei* information through POP ADS and direct mail, explain causal relationships using a systems thinking approach, and construct causal loop diagrams. Making comparisons with the causal loops, we also examine a case study from an actual retail store which takes advantage of *kansei* information in an attempt to increase customer buying motivation.

Keywords: *Kansei Information, Systems Thinking, Causality*

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1. INTRODUCTION

Considering product categories such as everyday sundries, processed food, and baby and nursing care products, a study has shown that the percentage of consumers who made a buying decision at a retail store is 70-80 percent in most of the product categories [1]. This implies the existence of some trigger that often incentivizes consumer to make unplanned purchases. One of the "triggers" involving purchase decisions is information that is transmitted to consumers. For example, window displays, direct mail, point-of-purchase advertisements (POP ADS), and television commercials all transmit information to consumers.

Among various types of such information, we have focused our research on *kansei* information, which is a result of cerebral processing of information obtained through the five senses which leads to positive affect along with changes in people's thinking. Conducting research that has tracked retail sites nationwide since 2000, we have observed and reported a phenomenon in which *kansei* information influences the buying behavior of people in various occupations and regions [2] [3] [4]. Moreover, through an experiment conducted at a retail site, we have demonstrated a method for increasing storefront sales by stimulating consumer buying motivation with information transmitted through POP ADS, which resulted in buying behavior [5] [6].

Here, we explore the possibility of creating a system dynamics model of marketing and sales activities that generates such buying behavior at retail sites, focusing on the effect of *kansei* information as the model's central element. We use systems dynamics because it is an appropriate approach to modeling and analyzing systems such as business operations, systems which involve complex and dynamic structures and factors and complicated causal relationships among the factors. An advantage of using system dynamics is that it can handle elements that are difficult to quantify. Moreover, simulations can be run with a system dynamics model. We believe that these facts potentially contribute to an approach to management that utilizes operational information obtained by examining hypotheses with a model, that is, model-based management, which is deemed useful in today's business environment [7].

Models of consumer buying behavior include a connectionist model in decision-making research in psychology studied by Tsuzuki and Guo [8].

Using systems dynamics, Kondo has modeled overall consumption behavior that includes buying activities [9]. He constructs a system dynamics model based on a systems thinking analysis of the AISAS process which has been proposed as a new consumption behavior model replacing the AIDMA process.

Koike constructs a system dynamics model of sales activities of firms and attempts to apply it to model-based management [10]. He builds a system dynamics model from a mental model based on actual experiences in route sales, conducts simulations, and attempts to utilize the result in actual sales activities.

We have also conducted research that uses systems thinking as an approach to constructing models. In a study of store loyalty, which is an emotional factor, we have examined the causal relationships between store loyalty and other factors and the process in which they generate

sales, and have discussed an example in which a firm's activities based on the understanding of such causal relationships actually improved customer loyalty and generated profits [11].

The present paper uses a systems thinking approach to analyze the phenomenon that *kansei* information induces buying (discussed in [5] [6]), and using causal loops, describes its causal relationships with a firm's activities for transmitting *kansei* information. The focus of this paper is *kansei* information transmitted to consumers through POP ADS and direct mail. This includes the text used in the POP ADS or direct mail, the shapes and colors of letters, and the visual as well as tactile quality of the paper used.

The remainder of the paper is organized as follows. Section 2 discusses the relationship between *kansei* information and sales. And this Section analyzes the relationship in terms of systems thinking and describes it with a causal loop diagram. Considering different factors, Section 3 reexamines the relationship and derives another diagram. Sections 4 and 5 take into account external factors that significantly affect the causal relationship and show corresponding diagrams. Section 6 discusses one example of experimental transmissions of *kansei* information that were conducted at actual sales sites based on the concept of the causal relationship. Section 7 concludes the paper.

2. CAUSAL RELATIONSHIP BETWEEN KANSEI INFORMATION AND SALES

We first consider the relationships between *kansei* information that potentially affects the execution of a purchase by consumers and their actual action induced by it as well as resulting sales. In what follows, the term "sales" refers to sales generated by an increase in consumers' willingness to make a purchase (WTMP) that is induced by *kansei* information.

Figure 1 is a causal loop diagram made based on the content discussed by this chapter.

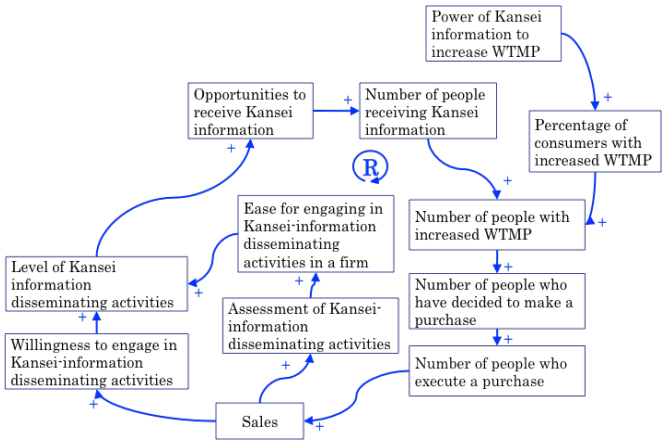

Figure 1: A causal loop diagram between *kansei* information and sales.

Sales are the result of consumers making a purchase. Therefore, the greater (smaller) the number of consumers executing purchases, the greater (smaller) the resulting sales. Next, purchase executions follow decisions to make purchases. Hence, the number of people making purchases increases (decreases) as the number of people who have decided to make their purchases rises (falls).

Moreover, a decision to make a purchase comes after a decision-making process involving the purchase, and the process begins with consumers' increased WTMP. Thus, the greater (smaller) the number of people with increased WTMP, the greater (smaller) the number of people who decide to make a purchase.

These relationships show that the generation of sales depends on the number of people with increased WTMP. What, then, affects the number of such people? There are two factors significantly affecting the number of people whose WTMP is increased by *kansei* information. One is the number of people who receive *kansei* information. The number of people experiencing increased WTMP rises (falls) as the number of people receiving *kansei* information rises (falls).

Another factor affecting the number of people with increased WTMP is the degree of influence that *kansei* information has. We call this the "power to increase WTMP". The stronger (weaker) the power to increase WTMP, the percentage and thus the number of people who are exposed to *kansei* information and experience an increase in WTMP rises (falls).

With systems thinking, let us examine further this relationships. We will examine whether sales generated as the result of *kansei* information would have some effects on the power to increase WTMP and the number of people receiving *kansei* information.

One result of experiencing newly generated sales is a greater level of activities for disseminating *kansei* information that aim to increase WTMP (or "*kansei*-information dissemination activity").

When *kansei*-information dissemination activities lead to further generation of sales, the willingness to engage in such activities is increased at retail sites. This increased willingness, in turn, results in more activities.

At the same time, employees can not take arbitrary actions in corporate settings, so without permission to spend necessary time and money on *kansei*-information dissemination activities, employees cannot realize activities. Therefore, the level of *kansei*-information dissemination activities depends on each firm's assessment on them, and a firm's evaluation of the activities becomes more favorable as sales generated by them rise. More favorable evaluations make it easier to engage in the activities, and thus more *kansei*-information dissemination activities are observed. However, the opposite scenario can also occur.

A greater amount of disseminated *kansei*-information raises the probability of more people receiving it. As more and more people receive the information, the number of people with increased WTMP rises, and the number of people who decide to make a purchase rises accordingly. However, again the opposite is also true.

A factor that significantly affects the number of people with increased WTMP is the power of *kansei* information to increase WTMP. No matter how large the number of people receiving *kansei* information, the number of people with increased WTMP would become smaller if its power to increase WTMP is weak.

3. RELATIONSHIP BETWEEN POWER OF KANSEI INFORMATION TO INCREASE WTMP AND SALES

As discussed in Section 2, an increase in the amount of *kansei* information disseminated does not necessarily lead to a rise in the number of people with increased WTMP. This fact is due to the significant influence of the power of *kansei* information to increase WTMP. This power, in turn, is greatly affected by how well *kansei* information is designed in terms of increasing WTMP. The amount of sales is substantially influenced by increasing the degree to which the design of *kansei* information contributes to the power to increase WTMP, referred to as the "design effectiveness" of *kansei* information.

The design effectiveness depends on the level of skills in designing *kansei* information that people engaging in information dissemination have. The skill level, in turn, is related to *kansei*-information dissemination activities.

If the level of *kansei*-information dissemination activities rises, people engaging in the activities gain more experience. As they become involved in more activities and gain more experience, they start delivering fruitful results with, for example, increased knowledge regarding the type of POP ADS that effectively increases WTMP for their firm's products. This is considered to be a result of increased experience and knowledge leading to better design of *kansei* information.

Moreover, greater levels of *kansei*-information dissemination activities leads to the accumulation of not only skills among the individuals engaging in the activities, but also data collected by a firm that are useful in improving the performance of the activities. Such information reveals consumer buying behavior associated with the firm's products or services, and as the amount of data grows, it becomes empirically evident for the firm what future steps will result in better performance. If a firm has a large amount of such data, it can choose more effective *kansei*-information dissemination activities even when people engaging in the activities are inexperienced and unskilled. In this way, a firm as a whole increases knowledge that is useful for *kansei*-information dissemination activities. Consequently, the design effectiveness of *kansei* information improves. Figure 2 shows a causal loop diagram describing the relationships between consumer buying motivation induced by *kansei* information and sales.

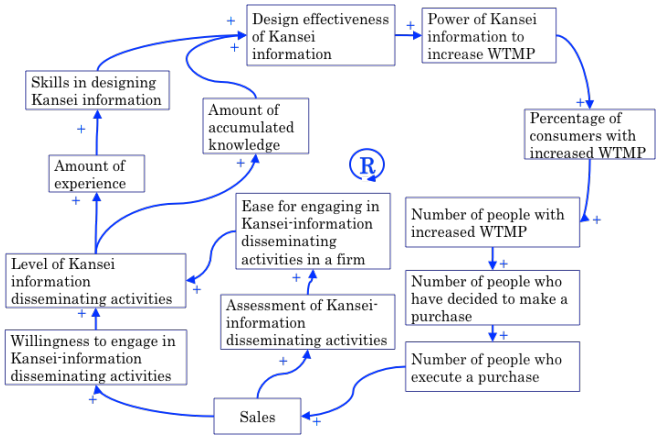

Figure 2: A causal loop diagram describing the relationships between consumer buying motivation induced by *kansei* information and sales.

4. EXTERNAL FACTORS AFFECTING THE NUMBER OF PEOPLE WITH INCREASED WILLINGNESS TO MAKE A PURCHASE

Besides the power of *kansei* information to increase willingness to make a purchase (WTMP), additional important factors exist that affect the number of people with increased WTMP. We have examined methods to induce actual consumption through the dissemination of *kansei* information and examples of relevant empirical experiments[5] [6]. The methods are based on three types of activities. The first involves the designing of *kansei* information. The other two involve the creation of a consumption model through the decomposition of consumer behavior, and the identification of the optimal timing for disseminating *kansei* information which involves finding points in a modeled consumer behavior that require incentives. The latter two activities are respectively referred to as consumer behavior design and the discovery of key behavior. These, along with the first activity of *kansei* information design, constitute the three factors required for generating consumer behavior through *kansei* information design.

Consumer behavior design and the discovery of key behavior influence the number of people with increased WTMP, as seen in our previous work ([5] [6]). No matter how great the design effectiveness of *kansei* information and the power of disseminated *kansei* information to increase WTMP, the number of people with increased WTMP could decrease with a lack of or inappropriate consumer behavior design or a lack of or imprecise key behavior identification. For example, even if a POP ADS with great power to increase WTMP is placed beside a product sold at a store, without a strategy to attract attention to the shelf on which the product and advertisement are placed or the effective dissemination of *kansei* information, people would just pass by the shelf without reading the advertisement and without putting the product in their shopping cart. Moreover, even when a large quantity of the product is displayed at the store and attracts the attention of many shoppers, they would not consider buying it if a strategy does not exist to have them receive *kansei* information and arouse their interest in the product.

Consumer behavior design and the discovery of key behavior enter the causal loop in Figure 2 as the "appropriateness of consumer behavior design" and the "preciseness of the discovery of key behavior" and act as external factors affecting the number of people with increased WTMP. After the next section, figure where these external factors were added is shown.

5. EXTERNAL FACTORS SUPPRESSING SALES GROWTH

Let us now turn to external effects that tend to suppress the growth of sales. Figures 1 and 2 show causal loops of "self-strengthening" type in which strengthening the power of *kansei* information to increase WTMP leads to limitless growth in sales. However, this does not happen in reality because of two major external factors which slow sales growth. One is customers becoming accustomed to existing *kansei* information. Once disseminated, *kansei* information is perceived by many people, and as this occurs, initial sales growth often slows or becomes negative. For example, when direct mail designed to enhance its *kansei* information is sent to a list of certain customers to promote the sales of a product, sales grow rapidly immediately after it is sent out, but slow over time and, eventually, become flat or start to decline. In such a case, customers are repeatedly exposed to the same *kansei* information and become accustomed to it, and its power to increase WTMP becomes weaker even though its design effectiveness remains constant. As a result, the number of people with increased WTMP

falls, leading to fewer people making purchases and slowing sales growth drastically. A concrete example of this phenomenon is discussed in the next section.

Figure 3 shows the causal loops discussed earlier, unified in a larger schematic view.

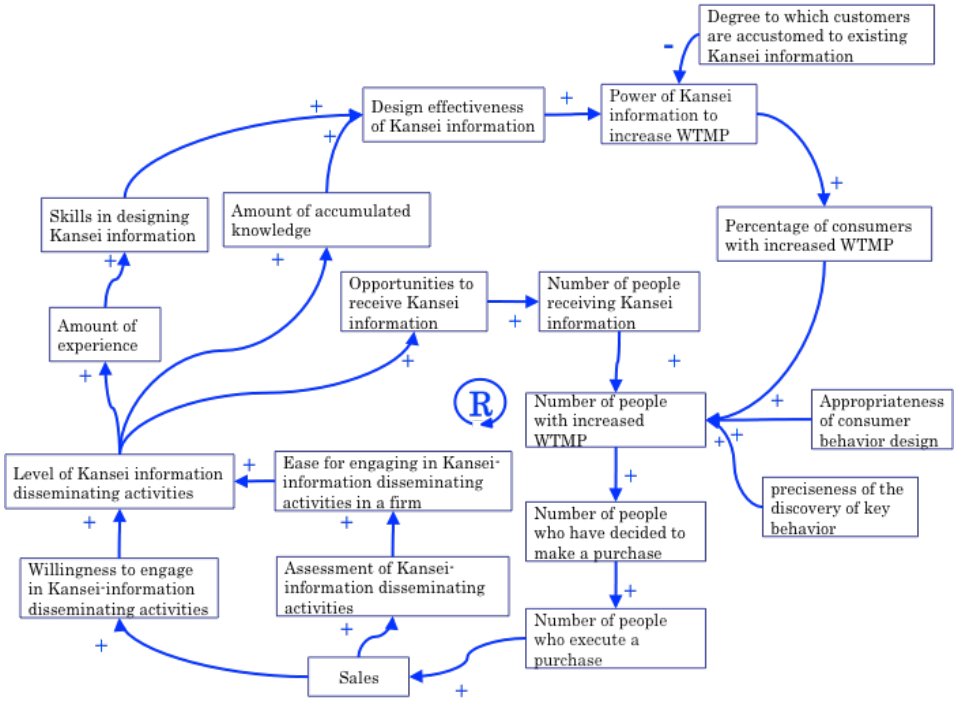

Figure 3: Unified View of the Causal Loops

6. CASE STUDY: SAKE SALES AT A LIQUOR STORE

This subsection discusses an experiment in which *kansei*-information dissemination activities were conducted at a retail site. The experiment was conducted at a liquor store (Asahiyama Chiba Etsuzo Shouten) in Kawaguchi City, Saitama Prefecture that was established in 1936.

One of the product categories that the store has maintained over the long term is sake and includes a product by Asashi Shuzo, called Yuku Toshi Kuru Toshi (The Year That Comes and Goes). The product is intended to be opened during the New Year's celebration, and sales traditionally start in late November. The store has sold the product every year, and the sales performance had been around 18 bottles annually.

In 2002, the store began engaging in *kansei*-information dissemination activities to promote the sales of the product. More concretely, it designed different *kansei* information for different types of customers, such as general customers and important customers, created direct mail, and sent or hand delivered it to around 550 individual customers on a list maintained by the store. It also created and sent or hand delivered several kinds of direct mail to business customers.

The text written in the direct mail played a decisive role in this strategy. In previous years, the store had transmitted information regarding the type of rice used for the sake, the degree to which the rice had been polished, and the taste of the sake, but this had fallen short of increasing customer WTMP. In response, the store owner employed design that would make *kansei*

information more effective in increasing WTMP. Specifically, for individual customers he clarified reasons for purchasing the product instead of listing product explanations, and limited the number of reasons to three. In order to promote sales, he also emphasized that if customers missed the opportunity to buy the product, it would not be available later. Moreover, to increase customer WTMP, he inserted a drawing of a person enjoying the sake, looking back over the year that had just passed.

As for business customers, the store owner devised a completely different strategy to incentivize them. Since most of the business customers were restaurants, he thought that the way to incentivize them was not to point out how the sake would bring good times as was done for individual customers, but to highlight how adding the sake to their menu would improve their profits for the year-end and New Year's season. He prepared direct mail that concretely described a proposal based on this argument and sent or hand delivered it.

As a result of these efforts in 2002, the sales of the product, which had been around 18 bottles in previous years, dramatically improved and reached 600 bottles. Moreover, it was sold out before the usual sales period began.

A point to keep in mind is that the product itself and its price were unchanged while the sales increased 32-fold relative to the sales of the preceding year. Also, no such sales growth was observed in the same year at other stores selling the same product. The store was the only one that experienced such a phenomenon. In addition, most of the customers targeted by the *kansei*-information dissemination effort in 2002 were existing customers of the store and were not so different from those customers who had bought a total of 18 bottles in previous years. These facts support an argument that *kansei*-information dissemination activities uniquely made by the liquor store increased the WTMP of its existing customers and resulted in the dramatic sales result.

The store engaged in another *kansei*-information dissemination activity in 2003 with newly added features. The store owner reported that despite the difficulty faced in creating new features, the employees were highly motivated by the result of dramatically increased sales in the preceding year. It was true that in 2002 when the efforts first started, many of them doubted its effectiveness, which hindered its progress. However, such doubt no longer existed in 2003. These facts show heightened motivation for and increased ease in conducting *kansei*-information dissemination activities resulting from sales generated by previously conducted activities. Moreover, as a result of the 2002 effort, the store gained various ideas that would be useful for the coming year and could contribute to the pool of knowledge on the sales of the product that the store had accumulated. This fact led to the improvement in the design effectiveness of *kansei* information.

The store also changed the content of its direct mail regarding this product in 2003 as well as sending out different direct mail three times, which had not been done in the preceding year. A major change in the content was the inclusion of post-consumption reviews of the product gathered from buyers of the previous year. The store asked them to write and send in their reviews in February. It has been said that such reviews are effective in providing an incentive to buy products to those who have not bought them before. He chose reviews that were deemed to provide great incentives and put them in a large section in the direct mail that was sent out in

2003. The reason for sending direct mail three times to the same customers on the list as opposed to sending it once, he tried to increase the number of opportunities to present *kansei* information and thus the number of people receiving the information. Figure 4 shows the direct mail sent out to customers for the third time.

Figure 4: Direct Mail that was sent out in 2003

As a result of the 2003 efforts, the sales of the product increased to 1,080 bottles. In 2004, the store continued its efforts, but because of damage to the production facilities caused by an earthquake, the store could not obtain sufficient supply and consequently experienced a fall in the sales of the product. However, the sales surpassed the 1,000 mark again in 2005, reaching 1,116 bottles, and grew constantly in subsequent years to reach 1,240 bottles in 2008.

As seen in Figure 5, this case study shows sales growth that drastically slowed after 2003 relative to the rapid growth in 2002 and 2003. Since the receivers of *kansei* information were essentially the same, this phenomenon was caused by the process in which the power of *kansei* information to increase WTMP weakened as customers became accustomed to existing *kansei* information, leading to a smaller number of purchases made relative to the number observed initially. The store has reviewed the activities of previous years and is making efforts to improve the design effectiveness of *kansei* information, which has produced a small rise in sales. However, if the store stops making such efforts, it is expected to face declining sales of the product.

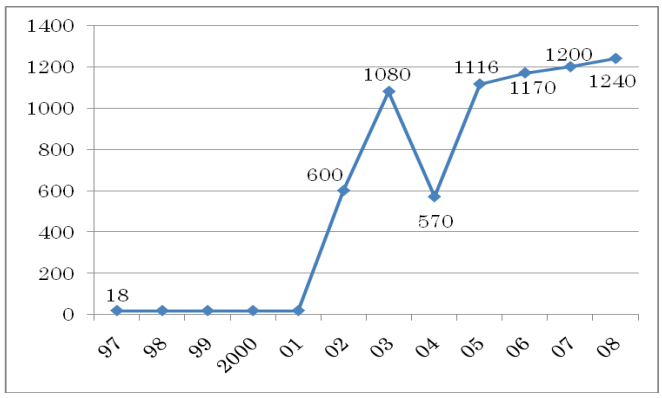

Figure 5: Sales record for the sake Yuku Toshi Kuru Toshi for the 1997-2008 period.

7. CONCLUSION

Using a systems thinking approach, this paper has examined the phenomenon in which buying behavior is induced by *kansei* information and has drawn causal loop diagrams describing its relationship with activities conducted by firms to disseminate *kansei* information. The result suggests the possibility for construct theories that are useful for today's marketing and sales activities by focusing on *kansei* information.

The tasks to be completed in the immediate future include further development of systems thinking methods, the construction of system dynamics models based on the causal loops presented in this paper, and simulations with specific parameter values which can be adjusted.

Moreover, there exists a close connection between sales and customer loyalty, which is an emotional attachment customers have to specific stores or brands [11]. Future research should consider an approach to integrate causal relationships centering on *kansei* information and those centering on consumer loyalty.

It is our hope to extend our method based on systems thinking and to make improvements on, for example, the system interface so that firms can easily use it in actual business settings as well as in model-based management.

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